

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION**

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**ORDER NO. R5-2007-0053  
NPDES NO. CA0085227**

**WASTE DISCHARGE REQUIREMENTS FOR  
CALIFORNIA DEPARTMENT OF FISH AND GAME  
LAKE DAVIS PIKE ERADICATION PROJECT  
PLUMAS COUNTY**

The following Discharger is subject to waste discharge requirements as set forth in this Order:

**Table 1. Discharger Information**

<b>Discharger</b>	California Department of Fish and Game
<b>Name of Facility</b>	Lake Davis Pike Eradication Project, Portola
<b>Facility Address</b>	Lake Davis, County Road 126
	Portola, CA
	Plumas County, 96122
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as a minor discharge.	

The discharge by the California Department of Fish and Game from the discharge points identified below is subject to waste discharge requirements as set forth in this Order:

**Table 2. Discharge Location**

<b>Discharge Point</b>	<b>Effluent Description</b>	<b>Discharge Point Latitude</b>	<b>Discharge Point Longitude</b>	<b>Receiving Water</b>
001	Discharge of rotenone treated water from Lake Davis	39° 53' 5" N	120° 28' 30" W	Big Grizzly Creek

**Table 3. Administrative Information**

This Order was adopted by the Regional Water Quality Control Board on:	June 21, 2007
This Order shall become effective on:	July 11, 2007
This Order shall expire on:	June 21, 2012
The Discharger shall file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than:	180 days prior to the Order expiration date

IT IS HEREBY ORDERED, that in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder and the provisions of the federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 21 June 2007.

original signed by

\_\_\_\_\_  
PAMELA C. CREEDON, Executive Officer

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## I. FACILITY INFORMATION

The following Discharger is subject to waste discharge requirements as set forth in this Order:

**Table 4. Facility Information**

<b>Discharger</b>	California Department of Fish and Game
<b>Name of Facility</b>	Lake Davis Pike Eradication Project
<b>Facility Address</b>	Lake Davis, County Road 126
	Portola, CA
	Plumas County, 96122
<b>Facility Contact, Title, and Phone</b>	Dr. Ed Pert, Project Manager, (916) 653-7889
<b>Mailing Address</b>	1416 Ninth Street Sacramento, CA 95814
<b>Type of Facility</b>	Man-made lake
<b>Facility Design Flow</b>	1.3 mgd

## II. FINDINGS

The California Regional Water Quality Control Board, Central Valley Region (hereinafter Regional Water Board), finds:

### A. Background.

1. The California Department of Fish and Game (hereinafter Discharger) submitted a Report of Waste Discharge, dated 11 November 2006, and applied for a National Pollutant Discharge Elimination System (NPDES) permit to discharge up to 1.3 mgd of lake water treated with the pesticide rotenone from Lake Davis during the Lake Davis Pike Eradication Project. After submitting additional information on the proposed treatment system, the application was deemed complete on 27 December 2006.

For the purposes of this Order, references to the “discharger” or “permittee” in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

2. The Discharger is responsible for carrying out a variety of fishery management activities. These activities are designed to protect and maintain valuable aquatic ecosystems and sport fisheries. The Discharger is also responsible under State and federal law for the restoration and protection of threatened and endangered species.

3. The Discharger, in cooperation with the U.S. Department of Agriculture, Forest Service (USFS), proposes to use the pesticide rotenone as part of the efforts to eradicate non-native northern pike from Lake Davis. Northern pike are a highly predacious non-native fish that can out compete and prey on native fish. It is feared that if the pike escape from Lake Davis, they would spread downstream to the Middle Fork Feather River and beyond, eventually to the Sacramento River and the Sacramento-San Joaquin River Delta. Such a spread of northern pike could severely impact the trout fishery in Big Grizzly Creek and the Middle Fork of the Feather River, and also impact salmon and other anadromous fish, including threatened or endangered species, below Lake Oroville and in the Sacramento River and Delta. The impacts could be catastrophic to native fisheries and seriously impact local economies.

## **B. Facility Description.**

1. Lake Davis is a State Water Project reservoir operated by the California Department of Water Resources in eastern Plumas County. The reservoir is surrounded by land administered by the Plumas National Forest. Grizzly Valley Dam impounds Big Grizzly Creek approximately 6 miles upstream from its confluence with the Middle Fork Feather River and five miles north of the City of Portola as shown in Attachment B.
2. Prior to the application of the pesticide rotenone to Lake Davis, the outlet from Grizzly Valley Dam will be closed to prevent the discharge of rotenone and the other formulation components to Big Grizzly Creek below the dam. The outlet will remain closed for a minimum of five days to allow for mixing of the formulation within the lake.
3. Approximately 15 days prior to applying rotenone to Lake Davis, the Discharger will treat the tributaries to Lake Davis to eliminate any pike that may reside in the streams. Due to the low volume of rotenone planned for treatment of the tributaries, the large volume of dilution available from Lake Davis, and the degradation of constituents that will occur during the travel between the tributary and Grizzly Valley Dam, detectable concentrations of residues are not expected in Big Grizzly Creek below the dam. Regardless, monitoring of the discharge from the dam for residuals from the rotenone formulations will be required.
4. Two liquid rotenone formulations registered for use in California, trade names CFT Legumine and NoxFish, may be applied to Lake Davis and its tributaries at some point in the fall when the lake is no longer strongly temperature stratified but before water temperatures drop to a level where the effectiveness of the rotenone is limited. The Discharger plans are to use CFT Legumine only, unless for some unforeseen reason it is not available in sufficient quantities. In such an instance the minimum amount of NoxFish necessary for an adequate treatment would be used. The selected pesticide will be applied to the open lake using boats, to the shoreline using boats or low pressure sprayer, and to tributaries using low pressure sprayer, or other appropriate methods. The application of the

pesticide will result in the elimination of northern pike and most other fish and many aquatic invertebrates in Lake Davis and its tributaries.

5. The rotenone will effectively kill most fish in Lake Davis, including all the northern pike, within a few days and the formulation constituents will breakdown into harmless byproducts within a few weeks. The Discharger has identified as the preferred alternative to keep the dam outlet closed for up to 45 days to allow all the formulation constituents to fully degrade. If keeping the dam outlet closed until the rotenone formulations are fully degraded is not possible, then the Discharger proposes to withdraw and treat the lake water with potassium permanganate within the lake area near the dam to neutralize the rotenone and oxidize the other formulation constituents as per the pesticide label instructions. The neutralized water would be discharged to Big Grizzly Creek via a pipeline over the dam spillway. These two alternatives for preventing the discharge of the pesticide to Big Grizzly Creek are identified as Neutralization Options 1 and 2 in the project documents.
6. The Discharger has also proposed, as Neutralization Options 3 and 4, to release water from the dam at two different flow rates five days after applying the pesticide to Lake Davis and adding the potassium permanganate neutralizing agent directly to Big Grizzly Creek. This will result in the neutralization of the rotenone within approximately 30 minutes contact time, equating to a stream distance of approximately 0.5 mile depending on flow. Since both rotenone and unreacted potassium permanganate are toxic to aquatic life, the use of Big Grizzly Creek as the key component of the reaction/neutralization system will result in the elimination of virtually all aquatic life within the 0.5 mile reach. An imbalance in the potassium permanganate application due to variability in the rotenone concentrations discharging from the dam could result in either residual concentrations of potassium permanganate or rotenone outside the target ranges. Such a condition could result in the death of fish and other aquatic life for a significant distance downstream similar to events that occurred in 1997. Improvements in neutralization methodologies, including shutting off the discharge from Grizzly Valley Dam for a minimum of five days and a more sophisticated and accurate method for applying potassium permanganate to the stream significantly reduce the potential for fish mortality downstream of the neutralization area.
7. To reduce biological oxygen demand (BOD) and the risk of bacteriological contamination of the lake waters, the Discharger will remove fish carcasses from Lake Davis as practical. The fish carcasses will be transported to a permitted disposal site approved by the Executive Officer.
8. Because Lake Davis is a municipal water supply, the Department of Health Services, Division of Drinking Water and Environmental Management (DHS) also has regulatory authority over the application of the pesticide. Health and Safety Code Section 116751 requires that the Discharger may not introduce a poison to a drinking water supply for purposes of fisheries management unless DHS

determines that the activity will not have a permanent adverse impact on the quality of the drinking water supply or wells connected to the drinking water supply. DHS has made the determination that the application of rotenone to Lake Davis will not have a short or long term effect on drinking water from the project. The Regional Water Board has reviewed the available data and concurs with this determination. A final copy of the document by DHS titled *Pike Eradication Project Determination of the Impact on the Water Quality of Lake Davis and Adjoining Wells* is included as part of the Monitoring and Reporting Program as Attachment E-1.

- C. Reason for Action.** On March 12, 2001, the Ninth Circuit Court of Appeals held that point-source discharges of pollutants associated with use of aquatic pesticides in waters of the United States require a NPDES permit because the residual pesticide left in the water after it has served its purpose was considered a “pollutant” (Headwaters, Inc. v. Talent Irrigation District). In 2005, the Ninth Circuit Court stated that the determinative issues in whether an NPDES permit was required was whether there is any “residue or unintended effect” from application of the pesticide. It is the “residue or unintended effect” that is the pollutant (Fairhurst v Hagener). Accordingly, the discharge of rotenone beyond the area of its intended use (Lake Davis) requires a NPDES permit. In a similar argument, the addition of potassium permanganate to neutralize the rotenone would be application of a chemical to waters for its intended use and not considered a pollutant. However, after the potassium permanganate has completely oxidized the rotenone, it may still be present in concentrations toxic to aquatic life. A NPDES permit is required in order to regulate the residue or unintended effect of the rotenone formulation and the potassium permanganate beyond its target use. The application of the chemicals to Lake Davis to for its intended use (kill pike) does not require an NPDES permit.
- D. Legal Authorities.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and chapter 5.5, division 7 of the California Water Code (commencing with section 13370). It shall serve as a NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the Water Code (commencing with section 13260).
- E. Background and Rationale for Requirements.** The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for Order requirements, is hereby incorporated into this Order and constitutes part of the Findings for this Order. Attachments A through E are also incorporated into this Order.
- F. California Environmental Quality Act (CEQA).** Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100-21177. While adoption of this NPDES permit by the Regional Water Board is exempt from preparation of a CEQA document, public entities

receiving exceptions from meeting CTR priority pollutant criteria/objectives, pursuant to section 5.3 of the SIP, are required to prepare a CEQA document. In January 2007, the Discharger completed a Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Lake Davis Pike Eradication Project (SCH#2005-09-2070), and filed a CEQA Notice of Determination for the project with the Governor's Office of Planning and Research on January 23, 2007. The Discharger also issued a document titled *CEQA Findings of Fact and Statement of Overriding Considerations* dated January 23, 2007. Similarly, the USFS issued a Record of Decision approving the Pike Eradication Project EIR/EIS on February 12, 2007.

**G. Effluent Limitations.** NPDES permits for discharges to surface waters must meet all applicable provisions of sections 301 and 402 of the Clean Water Act (CWA). These provisions require controls that use best available technology economically achievable (BAT), best conventional pollutant control technology (BCT), and any more stringent controls necessary to reduce pollutant discharges and meet water quality standards. Pursuant to section 122.44(k)(3) of Title 40 of the Code of Federal Regulations (CFR), BMPs may be required in NPDES permits in lieu of numeric effluent limits to control or abate the discharge of pollutants when numeric effluent limits are infeasible. Numeric effluent limits for pollutant discharges associated with the application of rotenone formulation and potassium permanganate neutralizing agent are not feasible, because in this case there is no definable "effluent" upon which limits can be placed. Rotenone and potassium permanganate are commercial products of formulated chemical composition, rather than an effluent waste stream from a controllable process or activity.

However, after being mixed with lake waters and achieving their intended effect, residuals of these materials may be considered pollutants where they would be discharged from the lake to a non-target stream. This permit requires that the Discharger implement BMPs to control or abate pollutants in the receiving water (Big Grizzly Creek) and comply with receiving water limitations. Those BMPs constitute BAT and BCT and will be implemented to minimize the area and duration of impacts caused by the discharge of aquatic pesticides in the treatment area. This approach will allow for restoration of water quality and the long-term protection of beneficial uses of the receiving water following completion of a treatment event.

**H. Receiving Water Limits.** Receiving Water Limits are required to protect the beneficial uses assigned to a waterbody. After the application of the BMPs for the application of the rotenone formulations to Lake Davis and the subsequent neutralization of the rotenone either by natural degradation (Neutralization Option 1) or by the addition of potassium permanganate as described on the pesticide label in an off-stream treatment system (Neutralization Option 2), the water can be discharged to Big Grizzly Creek. If Neutralization Options 3 or 4 are implemented where the rotenone will be neutralized in Big Grizzly Creek below the dam, receiving water limits must be met at a distance downstream of the potassium permanganate application point equal to 30 minutes travel time. Receiving Water Limits have been scientifically developed using appropriate criteria to protect the beneficial uses of Big Grizzly Creek. Details on the development of the Receiving Water Limits can be found in the Fact Sheet (Attachment F).

- I. Water Quality Control Plans.** The Regional Water Board adopted a *Water Quality Control Plan, Fourth Edition (Revised September 2004), for the Sacramento and San Joaquin River Basins* (hereinafter Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. The Basin Plan at page II-2.00 states that the “...*beneficial uses of any specifically identified water body generally apply to its tributary streams.*” The Basin Plan does not specifically identify beneficial uses for Big Grizzly Creek, but does identify present and potential uses for Middle Fork Feather River from Little Last Chance Creek to Lake Oroville, to which Big Grizzly Creek is tributary. These beneficial uses are as follows: municipal and domestic supply; water contact recreation, including canoeing and rafting; non-contact water recreation, including aesthetic enjoyment; warm freshwater habitat; cold freshwater habitat; cold spawning, reproduction, and /or early development; and wildlife habitat.

In addition, the Basin Plan implements State Water Resources Control Board (State Water Board) Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Further, while not specified in the Basin Plan for Middle Fork Feather River, Big Grizzly Creek is used as an agricultural supply, including stock watering. Based on the above discussion, the beneficial uses applicable to Big Grizzly Creek are as follows:

**Table 5. Basin Plan Beneficial Uses**

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	Big Grizzly Creek	<u>Existing:</u> Municipal and domestic water supply (MUN), Agriculture Irrigation, including stock watering (AGR), contact (REC-1) and non-contact (REC-2) water recreation, warm and cold freshwater habitat (WARM, COLD), cold water spawning (SPWN), and wildlife habitat (WILD).

The Basin Plan also allows the Regional Water Board, after compliance with CEQA, to allow short-term variances from Basin Plan provisions if determined to be necessary to implement control measures for fishery management conducted under statutory requirements of the Department of Fish and Game. The Department of Fish and Game certified an Environmental Impact Report for this project. This project will result in short term excursions outside of the Basin Plan provisions for Lake Davis and its tributaries and downstream for a limited distance in Big Grizzly Creek and is consistent with the Basin Plan.

Requirements of this Order implement the Basin Plan.

- J. National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.
- K. State Implementation Policy.** On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000 with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by the USEPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005 that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control.

Section 5.3 of the SIP allows the Regional Water Boards to grant short-term or seasonal categorical exceptions from meeting the CTR priority pollutant criteria for resource or pest management projects conducted by public entities. In order to qualify for an exception from meeting priority pollutant standards, a public entity must fulfill the requirements listed in section 5.3. Among other requirements, entities seeking an exception to complying with water quality standards for priority pollutants must submit CEQA documents (Public Resources Code Section 21000, et seq.).

The Discharger prepared a Final EIR/EIS (See Finding F above) in compliance with CEQA. The Lake Davis Pike Eradication Project meets the qualifications for an exception from meeting CTR priority pollutant criteria/objectives, and an exception is granted in the provisions of this permit. Therefore, effluent and receiving water monitoring for priority pollutants, as described in the SIP, is not required for this project.

- L. Compliance Schedules and Interim Requirements.** Not applicable.
- M. Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes. (40 CFR § 131.21; 65 Fed. Reg. 24641 (April 27, 2000).) Under the revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000 may be used for CWA purposes, whether or not approved by USEPA.
- N. Stringency of Requirements for Individual Pollutants.** This Order contains BMPs for the neutralization of rotenone and elimination of other formulation constituents in the

treatment area after the target species (Northern Pike) is eliminated. Receiving water limits are contained in this Order for individual pollutants including restrictions on rotenone, the formulation constituents, and the neutralizing agent, potassium permanganate.

The BMPs for the application of rotenone to Lake Davis, an off-stream treatment system and the receiving water limits have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "*applicable water quality standards for purposes of the [Clean Water] Act*" pursuant to 40 CFR section 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the applicable water quality standards for purposes of the CWA.

- O. Antidegradation Policy.** Section 131.12 requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 is consistent with the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies.

The temporary deterioration of water quality due to the use of rotenone formulations and potassium permanganate by the Discharger is justifiable in certain situations providing suitable measures are taken to protect water quality within and downstream of the project area. The Regional Water Board recognizes the threat to local trout fisheries and the potential long range adverse impacts to fisheries management in the Feather River and Sacramento River Delta system. Further, the Regional Water Board recognizes that the State and federal Endangered Species Acts require the restoration and preservation of threatened and endangered species. These resources are of important economic and social value to the people of the State, and the Regional Water Board finds that transitory degradation of water quality and short-term impairment of beneficial uses that would result from rotenone application is therefore justified and is in the best interest of the people of the State. The permitted discharge is therefore consistent with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16.

- P. Anti-Backsliding Requirements.** Not applicable

- Q. Proposition 65 Considerations.** Three ingredients present in one or both proposed rotenone formulations (N-methyl-2-pyrrolidone, ethylbenzene, and naphthalene) are on the Proposition 65 list of chemicals known to the State of California to cause cancer or reproductive toxicity. The Proposition 65 statute is contained in California Health and

Safety Code sections 25249.9-25249.13. Proposition 65 prohibits the discharge of chemicals known to cause cancer or reproductive toxicity. The State Attorney General's Office is the State agency responsible for enforcing Proposition 65. Section 25249 .11 (b) specifically exempts State agencies from the statute's provisions. Therefore, as a State agency, the Discharger is exempt from Proposition 65.

Further, as part of the EIR/EIS, the Discharger conducted a risk assessment for these chemicals and determined that they do not pose a threat to the public at the quantities and concentrations proposed for the project.

- R. Monitoring and Reporting.** Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorizes the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. The Discharger is required by DHS, Plumas County Environmental Health Department (PCEHD), and the Regional Water Board to conduct monitoring of Lake Davis, Big Grizzly Creek and adjoining domestic water supply wells. The Discharger also has developed monitoring criteria so the efficacy of the project can be determined in a document titled *Lake Davis Northern Pike Eradication Water Quality Monitoring Plan*, which contains many of the monitoring requirements. Since the Regional Water Board has jurisdiction in all water quality issues associated with the project, the ERMP is included in the Monitoring and Reporting Program for this permit in Attachment E-2.
- S. Standard and Special Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the Fact Sheet (Attachment F).
- T. Provisions and Requirements Implementing State Law.** The provisions/requirements in subsections V.B, and VI.C. of this Order are included to implement State law only. These provisions/requirements are not required or authorized under the federal CWA; consequently, violations of these provisions/requirements are not subject to the enforcement remedies that are available for NPDES violations.
- U. Notification of Interested Parties.** The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet (Attachment F).

- V. Consideration of Public Comment.** The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet (Attachment F).

### **III. DISCHARGE PROHIBITIONS**

- A. Discharge of rotenone treated water from Lake Davis at a location or in a manner different from that described in the Findings (Section II) is prohibited.
- B. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Federal Standard Provisions I.G. and I.H. (Attachment D).
- C. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.
- D. If Neutralization Options 1 or 2 are implemented, the discharge of rotenone treated water from Lake Davis or the use of potassium permanganate or other approved rotenone neutralizing agents shall not cause toxicity in Big Grizzly Creek downstream of the Grizzly Valley Dam. If Neutralization Options 3 or 4 are implemented, the discharge of rotenone treated water from Lake Davis or the use of potassium permanganate or other approved rotenone neutralizing agents shall not cause toxicity in Big Grizzly Creek at and beyond a distance downstream of the potassium permanganate application point equal to 30 minutes travel time from the point of application of the neutralizing agents.
- E. The use of the rotenone formulations to Lake Davis shall not cause any short- or long-term loss of Lake Davis as a drinking water supply as defined by the Department of Health Services.

### **IV. BEST MANAGEMENT PRACTICES AND APPLICATION SPECIFICATIONS**

The discharger is required to implement BMPs to manage the application of rotenone for its intended purpose- kill northern pike in Lake Davis, and manage the neutralization of the rotenone with potassium permanganate to prevent impacts to beneficial uses of Big Grizzly Creek downstream of Lake Davis. Required BMPs include, but are not limited to, those described below.

- A. The Discharger shall use only the two rotenone formulations which it has previously identified and characterized for this project, trade names CFT Legumine and NoxFish.
- B. Rotenone applications shall be made in accordance with label specifications.
- C. Applications must be conducted under the supervision of a licensed applicator in accordance with regulations of the California Department of Pesticide Regulation (DPR).
- D. Potassium permanganate shall be used, as per label instructions, to detoxify rotenone before it escapes the treatment area.

- E. The minimum concentration of chemicals determined necessary to achieve an effective rotenone treatment shall be applied.
- F. A suitable spill prevention and response plan for all chemical and petroleum products, including rotenone, potassium permanganate, and fuels shall be submitted to the Regional Water Board prior to implementation of the project. The Plan shall be updated as necessary and implemented during the project.
- G. Rotenone shall be applied only when ambient water temperatures are sufficiently high (greater than 5°C) to promote its rapid post-treatment breakdown.
- H. Water quality and efficacy monitoring shall be conducted inside and outside the treatment area.
- I. All project operations shall be conducted consistent with plans and management practices contained in documents submitted by the Discharger prior to the adoption of this permit, including the Final EIR/EIS, the *CEQA Findings of Fact and Statement of Overriding Considerations*, the *Lake Davis Northern Pike Eradication Water Quality Monitoring Plan*, and the USFS Record of Decision approving the Pike Eradication Project EIR/EIS, etc.
- J. The Discharger shall provide the public with adequate notice of the treatments, and post signs in the project area prior to treatment with appropriate warnings against public contact with water and fish while chemical residues are present.
- K. Mechanical disturbance of soils (for example, to construct earthen spill containment berms) in wetland or riparian habitats is prohibited unless appropriate permits such as a streambed alteration permit from CDFG and/or a dredge and fill permit from the U.S. Army Corp of Engineers) has been obtained
- L. The Discharger shall notify the Regional Water Board in writing or by phone at least fourteen **(14) days** in advance of the planned treatment event.
- M. Prior to reducing or eliminating flows from Lake Davis to Big Grizzly Creek, the Discharger shall capture fish from the reach of stream where flows will be reduced to fatal levels by electroshocking, netting or other appropriate live collection techniques and shall relocate the fish to suitable nearby habitat, to the extent feasible.
- N. Applications of rotenone and potassium permanganate must be made as described in the project EIR/EIS and these waste discharge requirements.
- O. Neutralization Options 3 and 4 may be used only if Neutralization Options 1 and 2 are infeasible due to conditions outside the Discharger's control and only after notification of the Executive Officer.

**A. Effluent Limitations.** Not applicable

**2. Interim Effluent Limitations,** Not applicable

**B Land Discharge Specifications ,** Not applicable

**C. Reclamation Specifications,** Not applicable

**V. RECEIVING WATER LIMITATIONS**

**A. Surface Water Limitations**

Receiving water limitations are based on water quality objectives contained in the Basin Plan and are a required part of this Order. The discharge shall not cause the following in Big Grizzly Creek below Grizzly Valley Dam at the noted locations:

- 1a. The Discharger shall maintain compliance with the receiving water limitations specified in Tables 6a and Tables 6b if utilizing Neutralization Option 1 or 2:

**Table 6a. Receiving Water Limitations 100 Feet Downstream of Grizzly Valley Dam Spillway (Monitoring Station Location BGC1.5a)**

Parameter	Units	Receiving Water Limitations			
		Average Monthly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Rotenone	ug/l				ND <sup>1,2</sup>
Rotenolone	ug/l				ND <sup>1,2</sup>
Methyl Pyrrolidone	ug/l				123 <sup>1,2</sup>
Potassium Permanganate	mg/l				1 <sup>1,2</sup>

<sup>1</sup> Test Methods and Reporting Limits are listed in Table F-2 in the Fact Sheet (Attachment F)

<sup>2</sup> These limits are protective of aquatic life

**Table 6b. Receiving Water Limitations 400 Yards Downstream of Grizzly Valley Dam (Monitoring Station Location BGC1..5b)**

Parameter	Units	Receiving Water Limitations			
		Average Monthly	Maximum Daily	Instantaneous Minimum	Rolling Annual Average
Diethylene glycol monoethyl ether	ug/l				21 <sup>1,2</sup>
Naphthalene	ug/l				21 <sup>1,2</sup>
Other VOCs and SVOCs	ug/l				ND <sup>1,2</sup>

<sup>1</sup> Test Methods and Reporting Limits are listed in Table F-2 in the Fact Sheet (Attachment F)

<sup>2</sup> These limits are protective of taste and odor for domestic drinking water

- 1.b. The Discharger shall maintain compliance with the receiving water limitations specified in Table 6c and Table 6d in utilizing Neutralization Option 3 or 4:

**Table 6c. Receiving Water Limitations at a distance equal to 30 minutes travel time from the point where the potassium permanganate neutralizing agent is added below Grizzly Valley Dam.**

Parameter	Units	Receiving Water Limitations			
		Average Monthly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Rotenone	ug/l				ND <sup>1,2</sup>
Rotenolone	ug/l				ND <sup>1,2</sup>
Methyl Pyrrolidone	ug/l				123
Potassium Permanganate	mg/l				1

<sup>1</sup> Test Methods and Reporting Limits are listed in Table F-2 in the Fact Sheet (Attachment F)

<sup>2</sup> These limits are protective of aquatic life

**Table 6d. Annual Average Receiving Water Limitations at a distance equal to 30 minutes travel time from the point where the potassium permanganate neutralizing agent is added below Grizzly Valley Dam.**

Parameter	Units	Receiving Water Limitations			
		Average Monthly	Maximum Daily	Instantaneous Minimum	Rolling Annual Average
Diethylene Glycol monoethyl ether	ug/l				21 <sup>1,2</sup>
Naphthalene	ug/l				21 <sup>1,2</sup>
Other VOCs and SVOCs	ug/l				ND <sup>1,2</sup>

<sup>1</sup> Test Methods and Reporting Limits are listed in Table F-2 in the Fact Sheet (Attachment F)

<sup>2</sup> These limits are protective of taste and odor for domestic drinking water

The receiving water limits below apply to any point in Big Grizzly Creek below Grizzly Valley Dam if Neutralization Options 1 or 2 are utilized, and at a distance equal to 30 minutes travel time downstream if Neutralization Options 3 or 4 are utilized.

The discharge shall not cause the following in Big Grizzly Creek downstream of at the locations described above:

2. **Bacteria.** The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, to exceed a geometric mean of 200 MPN/100 mL, nor more than ten percent of the total number of fecal coliform samples taken during any 30-day period to exceed 400 MPN/100 mL.
3. **Biostimulatory Substances.** Water to contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.

4. **Chemical Constituents.** Chemical constituents to be present in concentrations that adversely affect beneficial uses.
5. **Color.** The characteristic purple or brown color associated with the use of potassium permanganate as the neutralization agent to be discernable more than 2 miles downstream of the discharge point from the off-stream treatment system discharge if Neutralization 2 is used or 2 miles downstream from the point where it is added to Big Grizzly Creek if Neutralization Option 3 or 4 is used, or other discoloration that causes nuisance or adversely affects beneficial uses.
6. **Dissolved Oxygen:**
  - a. The monthly median of the mean daily dissolved oxygen concentration to fall below 85 percent of saturation in the main water mass;
  - b. The 95 percentile dissolved oxygen concentration to fall below 75 percent of saturation; nor
  - c. The dissolved oxygen concentration to be reduced below 7.0 mg/L at any time.
7. **Floating Material.** Floating material to be present in amounts that cause nuisance or adversely affect beneficial uses.
8. **Oil and Grease.** Oils, greases, waxes, or other materials to be present in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.
9. **pH.** The pH to be depressed below 6.5, nor changed by more than 0.5 units
10. **Pesticides:**
  - a. Pesticides to be present, individually or in combination, in concentrations that adversely affect beneficial uses;
  - b. Pesticides to be present in bottom sediments or aquatic life in concentrations that adversely affect beneficial uses;
  - c. Total identifiable persistent chlorinated hydrocarbon pesticides to be present in the water column at concentrations detectable within the accuracy of analytical methods approved by USEPA or the Executive Officer
  - d. Pesticide concentrations to exceed those allowable by applicable antidegradation policies (see State Water Board Resolution No. 68-16 and 40 CFR §131.12.).
  - e. Pesticide concentrations to exceed the lowest levels technically and economically achievable.
  - f. Pesticides to be present in concentration in excess of the maximum contaminant levels set forth in California Code of Regulations, Title 22, Division 4, Chapter 15 of the California Code of Regulations.
  - g. Thiobencarb to be present in excess of 1.0 µg/L.

**11. Radioactivity:**

- a. Radionuclides to be present in concentrations that are harmful to human, plant, animal, or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
- b. Radionuclides to be present in excess of the maximum contaminant levels specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations.

**12. Salinity.** Salinity measured as Electrical Conductivity to exceed 150 micromhos/cm.

**13. Suspended Sediments.** The suspended sediment load and suspended sediment discharge rate of surface waters to be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

**14. Settleable Substances.** Substances to be present in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

**15. Suspended Material.** Suspended material to be present in concentrations that cause nuisance or adversely affect beneficial uses.

**16. Taste and Odors.** Taste- or odor-producing substances to be present in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.

**17. Temperature.** The natural temperature to be increased by more than 5°F.

**18. Toxicity.** Toxic substances to be present, individually or in combination, in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.

**19. Turbidity.** The turbidity to increase as follows:

- a. More than 1 Nephelometric Turbidity Unit (NTU) where natural turbidity is between 0 and 5 NTUs.
- b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.
- c. More than 10 NTU where natural turbidity is between 50 and 100 NTUs.
- d. More than 10 percent where natural turbidity is greater than 100 NTUs.

**20.** Within 24 hours from cessation of neutralization activities, the water in Big Grizzly Creek downstream of Grizzly Valley Dam will meet all receiving water limitations.

## **B. Groundwater Limitations**

1. The discharge shall not cause groundwater underlying or downgradient of Lake Davis to contain rotenone formulation constituents or their breakdown products to be present in concentrations greater than background water quality.

## **VI. PROVISIONS**

### **A. Standard Provisions**

1. The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.
2. The Discharger shall comply with the following provisions:
  - a. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:
    - i. violation of any term or condition contained in this Order;
    - ii. obtaining this Order by misrepresentation or by failing to disclose fully all relevant facts;
    - iii. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; and
    - iv. a material change in the character, location, or volume of discharge.

The causes for modification include:

- *New regulations.* New regulations have been promulgated under Section 405(d) of the Clean Water Act, or the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued.

The Regional Water Board may review and revise this Order at any time upon application of any affected person or the Regional Water Board's own motion.

- b. If a toxic effluent standard or prohibition (including any scheduled compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the CWA, or amendments thereto, for a toxic pollutant that is present in the discharge authorized herein, and such standard or prohibition is more stringent than any limitation upon such pollutant in this Order, the Regional Water Board will revise or modify this Order in accordance with such toxic effluent standard or prohibition.

The Discharger shall comply with effluent standards and prohibitions within the time provided in the regulations that establish those standards or prohibitions, even if this Order has not yet been modified.

- c. This Order shall be modified, or alternately revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:
  - i. contains different conditions or is otherwise more stringent than any effluent limitation in the Order; or
  - ii. controls any pollutant limited in the Order.

The Order, as modified or reissued under this paragraph, shall also contain any other requirements of the CWA then applicable.

- d. The provisions of this Order are severable. If any provision of this Order is found invalid, the remainder of this Order shall not be affected.
- e. The Discharger shall take all reasonable steps to minimize any adverse effects to waters of the State or users of those waters resulting from any discharge or sludge use or disposal in violation of this Order. Reasonable steps shall include such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge or sludge use or disposal.
- f. The discharge of any radiological, chemical or biological warfare agent or high-level, radiological waste is prohibited.
- g. A copy of this Order shall be maintained at the discharge facility and be available at all times to operating personnel. Key operating personnel shall be familiar with its content.
- h. Safeguard to electric power failure:
  - i. The Discharger shall provide safeguards to assure that, should there be reduction, loss, or failure of electric power, the discharge shall comply with the terms and conditions of this Order.
  - ii. Upon written request by the Regional Water Board the Discharger shall submit a written description of safeguards. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means. A description of the safeguards provided shall include an analysis of the frequency, duration, and impact of power failures experienced over the past five years on effluent quality and on the capability of the Discharger to comply with the terms and conditions of the Order. The adequacy of the safeguards is subject to the approval of the Regional Water Board.

- iii. Should the treatment works not include safeguards against reduction, loss, or failure of electric power, or should the Regional Water Board not approve the existing safeguards, the Discharger shall, within ninety days of having been advised in writing by the Regional Water Board that the existing safeguards are inadequate, provide to the Regional Water Board and USEPA a schedule of compliance for providing safeguards such that in the event of reduction, loss, or failure of electric power, the Discharger shall comply with the terms and conditions of this Order. The schedule of compliance shall, upon approval of the Regional Water Board, become a condition of this Order.
- i. The Discharger, upon written request of the Regional Water Board, shall file with the Board a technical report on its preventive (failsafe) and contingency (cleanup) plans for controlling accidental discharges, and for minimizing the effect of such events. This report may be combined with that required under Regional Water Board Standard Provision VI.A.2.m.

The technical report shall:

- i. Identify the possible sources of spills, leaks, untreated waste by-pass, and contaminated drainage. Loading and storage areas, power outage, waste treatment unit outage, and failure of process equipment, tanks and pipes should be considered.
- ii. Evaluate the effectiveness of present facilities and procedures and state when they became operational.
- iii. Predict the effectiveness of the proposed facilities and procedures and provide an implementation schedule containing interim and final dates when they will be constructed, implemented, or operational.

The Regional Water Board, after review of the technical report, may establish conditions which it deems necessary to control accidental discharges and to minimize the effects of such events. Such conditions shall be incorporated as part of this Order, upon notice to the Discharger.

- j. The Discharger shall submit technical reports as directed by the Executive Officer. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code, sections 6735, 7835, and 7835.1. To demonstrate compliance with Title 16, CCR, sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

- k. Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Regional Water Board and USEPA.
- l. The Discharger shall conduct analysis on any sample provided by USEPA as part of the Discharge Monitoring Quality Assurance (DMQA) program. The results of any such analysis shall be submitted to USEPA's DMQA manager.
- m. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to mixing with the receiving waters. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.
- n. All monitoring and analysis instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy.
- o. The Discharger shall file with the Regional Water Board technical reports on self-monitoring performed according to the detailed specifications contained in the Monitoring and Reporting Program attached to this Order.
- p. The results of all monitoring required by this Order shall be reported to the Regional Water Board, and shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this Order. Unless otherwise specified, discharge flows shall be reported in terms of the monthly average and the daily maximum discharge flows.
- q. The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the CWC, including, but not limited to, sections 13385, 13386, and 13387.
- r. Prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater that results in a decrease of flow in any portion of a watercourse, the Discharger must file a petition with the State Water Board, Division of Water Rights, and receive approval for such a change (CWC section 1211).
- s. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition, maximum daily effluent limitation, 1-hour average effluent limitation, or receiving water limitation contained in this Order, the Discharger shall notify the Regional Water Board by telephone (916) 464-3291 within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Regional Water Board waives confirmation. The written notification shall include the information required by Attachment D, Section V.E.1 [40 CFR section 122.41(l)(6)(i)].

## **B. Monitoring and Reporting Program (MRP) Requirements**

1. The Discharger shall comply with the MRP which is in Attachment E of this Order and includes the documents titled *Lake Davis Northern Pike Eradication Water Quality Monitoring Plan* developed in conjunction with the Discharger, DHS, Plumas County Environmental Health Department, and *Determination of the Impact on the water Quality of Lake Davis and Adjoining Wells* by DHS and future revisions thereto as approved by the Executive Officer.
2. The Executive Officer may, pursuant to Section 13267 of the CWC, require additional monitoring as necessary to ensure compliance with other requirements and conditions of this NPDES permit.

## **C. Special Provisions**

### **1. Reopener Provisions**

This Order may be reopened for modification, or revocation and reissuance, as a result of:

- a. The detection of a reportable priority pollutant generated by special conditions included in this Order. These special conditions may be, but are not limited to, fish tissue sampling, whole effluent toxicity, monitoring requirements on internal waste stream(s), and monitoring for surrogate parameters. Additional requirements may be included in this Order as a result of the special condition monitoring data.
- b. Substitution of the two rotenone formulations approved for use in this Order, CFT Legumine and NoxFish.
- c. Discovery of chemical compounds in the two rotenone formulations not previously reported to the Regional Water Board and that have the potential to impact the beneficial uses of Lake Davis and Big Grizzly Creek.
- d. Conditions that necessitate a major modification of a permit are described in 40 CFR section 122.62, including:
  - i. If new or amended applicable water quality standards are promulgated or approved pursuant to Section 303 of the CWA, or amendments thereto, this permit may be reopened and modified in accordance with the new or amended standards.
  - ii. When new information, that was not available at the time of permit issuance, would have justified different permit conditions at the time of issuance.

## 2. Exception From Priority Pollutant Criteria

An exception from meeting priority pollutant criteria is hereby granted subject to the provisions of section 5.3 of the SIP. The Discharger shall comply with all provisions of section 5.3.

## 3. Construction, Operation and Maintenance Specifications

### Rotenone Neutralization System

- a. The rotenone neutralization systems for Options 2-4 shall be designed and construction overseen by a California licensed Civil Engineer. All plans and specifications for the system shall be developed under the supervision of the Engineer and be submitted to the Regional Water Board 30 days prior to initiating construction.
- b. The rotenone neutralization systems shall be capable of completely neutralizing residual rotenone with potassium permanganate and removing other formulation constituents adequately to meet the receiving water limitations in Big Grizzly Creek at the locations described in **Section V. Receiving Water Limitations**.
- c. The rotenone neutralization systems shall be designed, constructed, operated, and maintained to prevent inundation or washout due to unexpected rises in lake levels during the project.
- d. The rotenone neutralization systems shall be continuously attended by qualified personnel when the system is in operation.
- e. An Operation and Maintenance Manual for the off-stream rotenone neutralization system shall be developed and made available to operating personnel. A copy of the manual shall be kept at the site at all times for reference and all operating personnel shall be familiar with its contents. A copy of the manual shall be submitted to the Regional Water Board prior to operation of the neutralization system.
- f. The names and qualifications of all operating personnel and emergency contact information shall be provided to the Regional Water Board prior to initiating operation of the system

## 4. Fish Carcass Disposal

Collected fish carcasses shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, section 20005, et seq.

## VII. COMPLIANCE DETERMINATION

Compliance with the receiving water limits contained in Section V of this Order will be determined as specified below:

- A. **Rotenone Formulation Constituents and Potassium Permanganate.** Any exceedance above either the detection limit provided in Table F.2., Attachment F or the numeric limit provided in Tables 6a, 6b, 6c or 6d, Section V.A.1. will immediately trigger a resampling and be deemed a violation of these requirements.
- B. **In-Stream Toxicity.** The presence of toxicity in Big Grizzly Creek downstream of Grizzly Valley Dam resulting from the application of the rotenone formulations, either due the failure to collect any seepage of toxic constituents through the dam (Neutralization Option 1) or from inefficient operation of the off-stream rotenone neutralization system (Neutralization Option 2) will be deemed a violation of these requirements. In the event Neutralization Option 3 or 4 is used, the presence of toxicity beyond the 30 minute travel time distance downstream of the point of application of potassium permanganate will be deemed a violation of these requirements. Toxicity will be determined by the death of the majority of rainbow trout in each live car placed at the point of discharge or downstream as provided in Section IX in the Monitoring and Reporting Program (Attachment E).
- C. Failure to comply with any of the surface water limitations contained in Section V.

## ATTACHMENT A – DEFINITIONS

**Arithmetic Mean ( $\mu$ )**, also called the average, is the sum of measured values divided by the number of samples. For ambient water concentrations, the arithmetic mean is calculated as follows:

Arithmetic mean =  $\mu = \Sigma x / n$       where:  $\Sigma x$  is the sum of the measured ambient water concentrations, and  $n$  is the number of samples.

**Best Management Practices (BMPs)**: are methods, measures, or practices designed and selected to reduce or eliminate the discharge of pollutants to surface waters from point and nonpoint source discharges including storm water. BMPs include structural and non-structural controls, and operation and maintenance procedures, which can be applied before, during, and/or after pollution producing activities.

**Best Practicable Treatment or Control (BPTC)**: BPTC is a requirement of State Water Resources Control Board Resolution 68-16 – “Statement of Policy with Respect to Maintaining High Quality of Waters in California” (referred to as the “Antidegradation Policy”). BPTC is the treatment or control of a discharge necessary to assure that, *“(a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.”* Pollution is defined in CWC Section 13050(I). In general, an exceedance of a water quality objective in the Basin Plan constitutes “pollution”.

**Coefficient of Variation (CV)** is a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

**Detected, but Not Quantified (DNQ)** are those sample results less than the RL, but greater than or equal to the laboratory’s MDL.

**Estimated Chemical Concentration** is the estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value.

**Inland Surface Waters** are all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

**Instantaneous Maximum Effluent Limitation**: the highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

**Instantaneous Minimum Effluent Limitation**: the lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

**Maximum Daily Effluent Limitation (MDEL)** means the highest allowable daily discharge of a pollutant, over a calendar day (or 24-hour period). For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged

over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

**Median** is the middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements ( $n$ ) is odd, then the median =  $X_{(n+1)/2}$ . If  $n$  is even, then the median =  $(X_{n/2} + X_{(n/2)+1})/2$  (i.e., the midpoint between the  $n/2$  and  $n/2+1$ ).

**Method Detection Limit (MDL)** is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in title 40 of the Code of Federal Regulations, Part 136, Attachment B, revised as of July 3, 1999.

**Minimum Level (ML)** is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

**Not Detected (ND)** are those sample results less than the laboratory's MDL.

**Persistent** pollutants are substances for which degradation or decomposition in the environment is nonexistent or very slow.

**Pollution Prevention** means any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes, but is not limited to, input change, operational improvement, production process change, and product reformulation (as defined in Water Code section 13263.3). Pollution prevention does not include actions that merely shift a pollutant in wastewater from one environmental medium to another environmental medium, unless clear environmental benefits of such an approach are identified to the satisfaction of the State or Regional Water Board.

**Reporting Level (RL)** is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the Regional Water Board either from Appendix 4 of the SIP in accordance with section 2.4.2 of the SIP or established in accordance with section 2.4.3 of the SIP. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the RL.

**Source of Drinking Water** is any water designated as municipal or domestic supply (MUN) in a Regional Water Board Basin Plan.

**Standard Deviation ( $\sigma$ )** is a measure of variability that is calculated as follows:

$$\sigma = (\sum[(x - \mu)^2]/(n - 1))^{0.5}$$

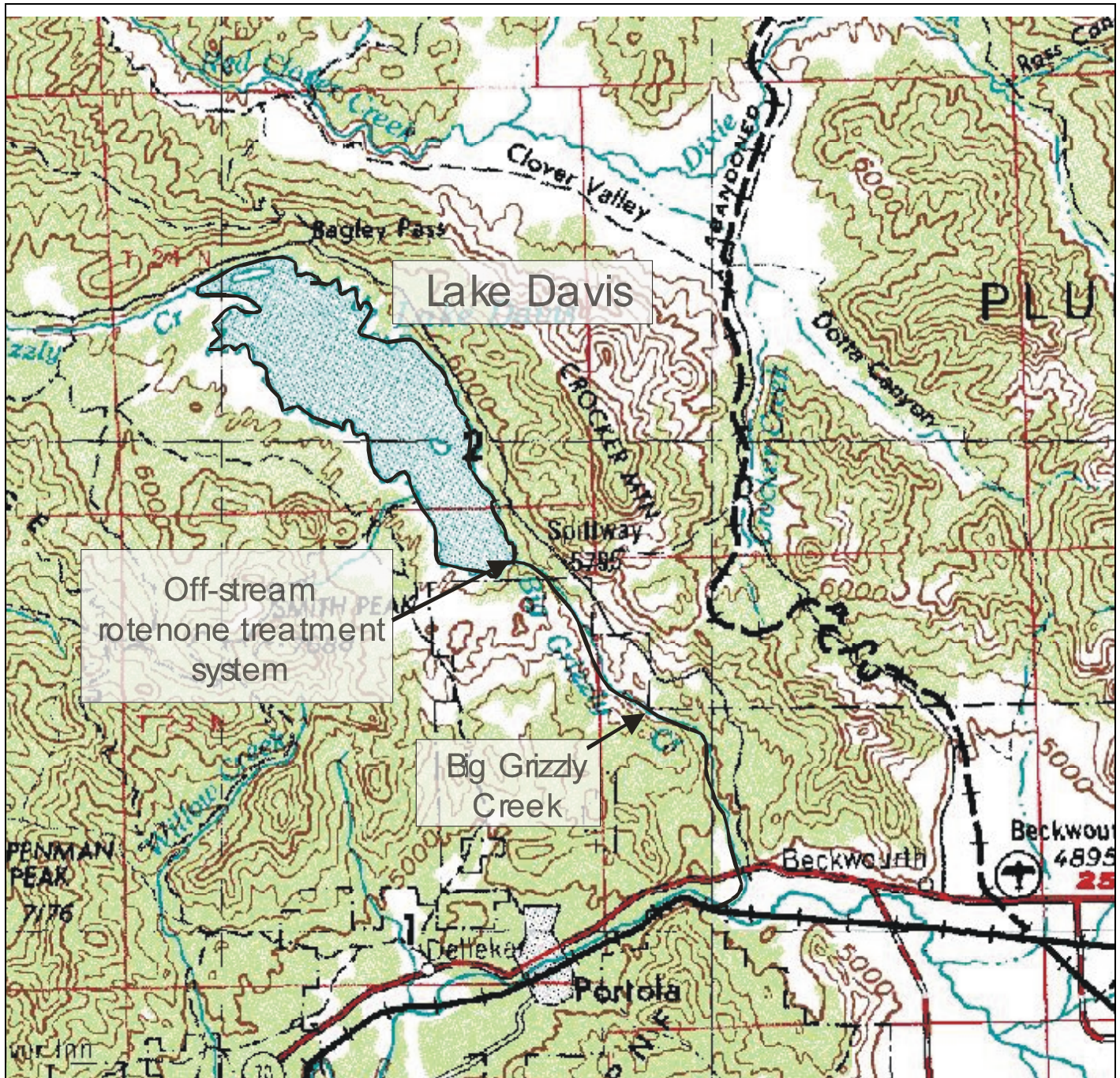
where:

x is the observed value;

$\mu$  is the arithmetic mean of the observed values; and

n is the number of samples.

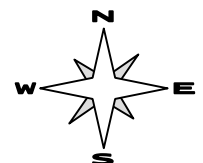
## ATTACHMENT B – MAP



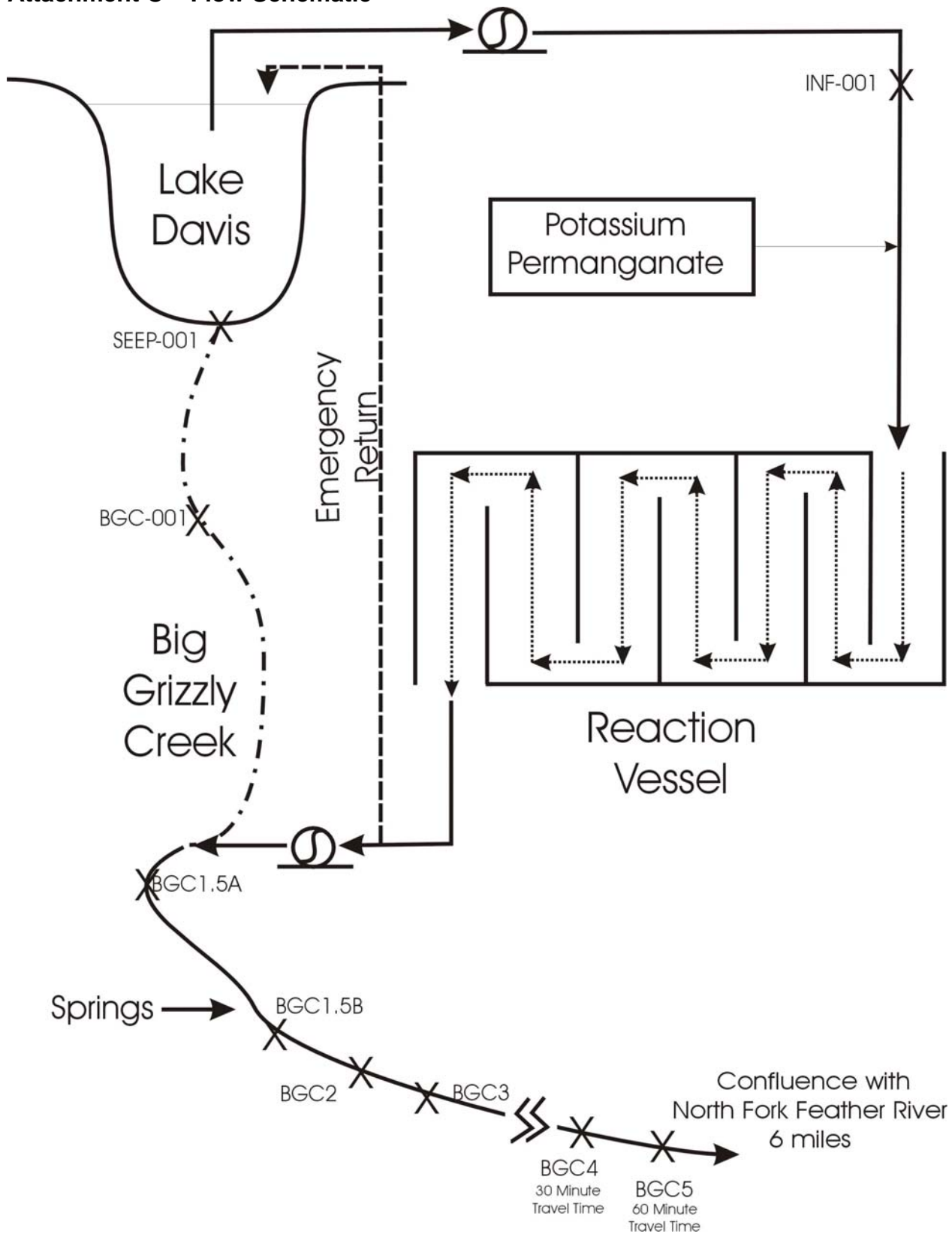
Drawing Reference:  
**PORTOLA**  
U.S.G.S TOPOGRAPHIC MAP  
7.5 MINUTE QUADRANGLE

Scale 1 Inch = 2 Miles

SITE LOCATION MAP  
CALIFORNIA DEPARTMENT OF FISH AND  
GAME  
LAKE DAVIS PIKE ERADICATION PROJECT  
PLUMAS COUNTY



**Attachment C – Flow Schematic**



## **Attachment D –Standard Provisions**

### **I. STANDARD PROVISIONS – PERMIT COMPLIANCE**

#### **A. Duty to Comply**

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 C.F.R. § 122.41(a).)
2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement. (40 C.F.R. § 122.41(a)(1).)

#### **B. Need to Halt or Reduce Activity Not a Defense**

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order. (40 C.F.R. § 122.41(c).)

#### **C. Duty to Mitigate**

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. (40 C.F.R. § 122.41(d).)

#### **D. Proper Operation and Maintenance**

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order. (40 C.F.R. § 122.41(e).)

#### **E. Property Rights**

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 C.F.R. § 122.41(g).)

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 C.F.R. § 122.5(c).)

## **F. Inspection and Entry**

The Discharger shall allow the Regional Water Board, State Water Board, United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (40 C.F.R. § 122.41(i); Water Code, § 13383):

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order (40 C.F.R. § 122.41(i)(1));
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (40 C.F.R. § 122.41(i)(2));
3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (40 C.F.R. § 122.41(i)(3)); and
4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (40 C.F.R. § 122.41(i)(4).)

## **G. Bypass**

1. Definitions
  - a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. (40 C.F.R. § 122.41(m)(1)(i).)
  - b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 C.F.R. § 122.41(m)(1)(ii).)
2. Bypass not exceeding limitations. The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3, I.G.4, and I.G.5 below. (40 C.F.R. § 122.41(m)(2).)

3. Prohibition of bypass. Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless (40 C.F.R. § 122.41(m)(4)(i)):
  - a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 C.F.R. § 122.41(m)(4)(i)(A));
  - b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance (40 C.F.R. § 122.41(m)(4)(i)(B)); and
  - c. The Discharger submitted notice to the Regional Water Board as required under Standard Provisions – Permit Compliance I.G.5 below. (40 C.F.R. § 122.41(m)(4)(i)(C).)
4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 C.F.R. § 122.41(m)(4)(ii).)
5. Notice
  - a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass. (40 C.F.R. § 122.41(m)(3)(i).)
  - b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). (40 C.F.R. § 122.41(m)(3)(ii).)

## **H. Upset**

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. (40 C.F.R. § 122.41(n)(1).)

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance I.H.2 below are met. No determination made during administrative review of claims that noncompliance was

caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. (40 C.F.R. § 122.41(n)(2).).

2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that (40 C.F.R. § 122.41(n)(3)):
  - a. An upset occurred and that the Discharger can identify the cause(s) of the upset (40 C.F.R. § 122.41(n)(3)(i));
  - b. The permitted facility was, at the time, being properly operated (40 C.F.R. § 122.41(n)(3)(ii));
  - c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) (40 C.F.R. § 122.41(n)(3)(iii)); and
  - d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 C.F.R. § 122.41(n)(3)(iv).)
3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof. (40 C.F.R. § 122.41(n)(4).)

## **II. STANDARD PROVISIONS – PERMIT ACTION**

### **A. General**

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition. (40 C.F.R. § 122.41(f).)

### **B. Duty to Reapply**

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit. (40 C.F.R. § 122.41(b).)

### **C. Transfers**

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 C.F.R. § 122.41(l)(3); § 122.61.)

### **III. STANDARD PROVISIONS – MONITORING**

- A.** Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 C.F.R. § 122.41(j)(1).)
- B.** Monitoring results must be conducted according to test procedures under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503 unless other test procedures have been specified in this Order. (40 C.F.R. § 122.41(j)(4); § 122.44(i)(1)(iv).)

### **IV. STANDARD PROVISIONS – RECORDS**

- A.** Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by Part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Water Board Executive Officer at any time. (40 C.F.R. § 122.41(j)(2).)

**B. Records of monitoring information shall include:**

- 1. The date, exact place, and time of sampling or measurements (40 C.F.R. § 122.41(j)(3)(i));
- 2. The individual(s) who performed the sampling or measurements (40 C.F.R. § 122.41(j)(3)(ii));
- 3. The date(s) analyses were performed (40 C.F.R. § 122.41(j)(3)(iii));
- 4. The individual(s) who performed the analyses (40 C.F.R. § 122.41(j)(3)(iv));
- 5. The analytical techniques or methods used (40 C.F.R. § 122.41(j)(3)(v)); and
- 6. The results of such analyses. (40 C.F.R. § 122.41(j)(3)(vi).)

**C. Claims of confidentiality for the following information will be denied (40 C.F.R. § 122.7(b)):**

- 1. The name and address of any permit applicant or Discharger (40 C.F.R. § 122.7(b)(1)); and
- 2. Permit applications and attachments, permits and effluent data. (40 C.F.R. § 122.7(b)(2).)

## **V. STANDARD PROVISIONS – REPORTING**

### **A. Duty to Provide Information**

The Discharger shall furnish to the Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or USEPA copies of records required to be kept by this Order. (40 C.F.R. § 122.41(h); Water Code, § 13267.)

### **B. Signatory and Certification Requirements**

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below. (40 C.F.R. § 122.41(k).)
2. All permit applications shall be signed by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of USEPA). (40 C.F.R. § 122.22(a)(3).)
3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
  - a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above (40 C.F.R. § 122.22(b)(1));
  - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) (40 C.F.R. § 122.22(b)(2)); and
  - c. The written authorization is submitted to the Regional Water Board and State Water Board. (40 C.F.R. § 122.22(b)(3).)
4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall

operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 C.F.R. § 122.22(c).)

5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.” (40 C.F.R. § 122.22(d).)

### **C. Monitoring Reports**

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order. (40 C.F.R. § 122.22(l)(4).)
2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. (40 C.F.R. § 122.41(l)(4)(i).)
3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Water Board. (40 C.F.R. § 122.41(l)(4)(ii).)
4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order. (40 C.F.R. § 122.41(l)(4)(iii).)

### **D. Compliance Schedules**

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date. (40 C.F.R. § 122.41(l)(5).)

### **E. Twenty-Four Hour Reporting**

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (40 C.F.R. § 122.41(l)(6)(i).)
2. The following shall be included as information that must be reported within 24 hours under this paragraph (40 C.F.R. § 122.41(l)(6)(ii)):
  - a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(A).)
  - b. Any upset that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(B).)
3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. (40 C.F.R. § 122.41(l)(6)(iii).)

### **F. Planned Changes**

The Discharger shall give notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when (40 C.F.R. § 122.41(l)(1)):

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in section 122.29(b) (40 C.F.R. § 122.41(l)(1)(i)); or
2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in this Order nor to notification requirements under section 122.42(a)(1) (see Additional Provisions—Notification Levels VII.A.1). (40 C.F.R. § 122.41(l)(1)(ii).)

### **G. Anticipated Noncompliance**

The Discharger shall give advance notice to the Regional Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements. (40 C.F.R. § 122.41(l)(2).)

## **H. Other Noncompliance**

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E above. (40 C.F.R. § 122.41(l)(7).)

## **I. Other Information**

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. § 122.41(l)(8).)

## **VI. STANDARD PROVISIONS – ENFORCEMENT**

- A.** The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.

## **VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS**

### **A. Non-Municipal Facilities**

Existing manufacturing, commercial, mining, and silvicultural Dischargers shall notify the Regional Water Board as soon as they know or have reason to believe (40 C.F.R. § 122.42(a)):

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" (40 C.F.R. § 122.42(a)(1)):
  - a. 100 micrograms per liter (µg/L) (40 C.F.R. § 122.42(a)(1)(i));
  - b. 200 µg/L for acrolein and acrylonitrile; 500 µg/L for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/L) for antimony (40 C.F.R. § 122.42(a)(1)(ii));
  - c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(1)(iii)); or
  - d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(1)(iv).)
2. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this Order,

if that discharge will exceed the highest of the following "notification levels" (40 C.F.R. § 122.42(a)(2)):

- a. 500 micrograms per liter ( $\mu\text{g/L}$ ) (40 C.F.R. § 122.42(a)(2)(i));
- b. 1 milligram per liter ( $\text{mg/L}$ ) for antimony (40 C.F.R. § 122.42(a)(2)(ii));
- c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(2)(iii)); or
- d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(2)(iv).)

## ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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## **ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)**

The Code of Federal Regulations section 122.48 requires that all NPDES permits specify monitoring and reporting requirements. Water Code Sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and state regulations.

### **I. GENERAL MONITORING PROVISIONS**

- A. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and the approval of this Regional Water Board.
- B. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. In the event a certified laboratory is not available to the Discharger, analyses performed by a noncertified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by Regional Water Board staff. The Quality Assurance-Quality Control Program must conform to USEPA guidelines or to procedures approved by the Regional Water Board.
- C. All standard analyses shall be performed in a laboratory certified to perform such analyses by the California Department of Health Services. Laboratories that perform sample analyses shall be identified in all monitoring reports.
- D. There are no established EPA methods for the analyses for rotenone or rotenolone. These chemicals shall be analyzed using the analytical method described by Dawson, V., P. Harmon, D. Schultz, and J. Allen, 1983. *Rapid method for measuring rotenone in water at piscicidal concentration*. Trans. Amer. Fish. Soc. 112:725-728. The Discharger's laboratory is capable of performing these analyses.
- E. There are no established EPA methods for the analyses for n-Methyl-2pyrrolidone and Diethylene glycol ethyl ether, however EPA Method 8015b does allow for the analyses to be conducted via a non-standard method. Further, the discharger is currently validating the use of direct injection and analysis by LCMS with recovery superior to EPA Method 8015b. The Discharger's laboratory is capable of performing these analyses.
- F. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be

properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per month to ensure continued accuracy of the devices.

- G. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this Monitoring and Reporting Program.
- H. The Discharger is required to monitor only for those constituents contained in the rotenone formulation selected for the treatment as listed in Table F-2 of the Fact Sheet. If both formulations are used, then all constituents listed must be monitored for at the locations and frequencies listed in this Monitoring and Reporting Program.
- I. Sampling and analyses for each constituent listed in the monitoring program shall continue until analyses show that the constituent concentration in Lake Davis is below the detection limit for three consecutive sampling events.

## II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the surface water limitations, and other requirements in this Order:

**Table E-1. Monitoring Station Locations**

Discharge Point Name	Monitoring Location Name	Monitoring Location Description (include Latitude and Longitude when available)
Seepage from Grizzly Valley Dam	SEEP-001	Grizzly Valley Dam Toe Drains
Off-stream Rotenone Neutralization System	INF-001	Influent to Rotenone Neutralization System
Rotenone Neutralization System	EFF-001	Effluent from Rotenone Neutralization System before entering Big Grizzly Creek
Big Grizzly Creek	BGC-1	Big Grizzly Creek immediately below Grizzly Valley Dam
Big Grizzly Creek	BGC-1.5a	Big Grizzly Creek 100feet downstream of the discharge point of the off-stream Rotenone Neutralization Station (EFF-001)
Big Grizzly Creek	BGC-1.5b	Big Grizzly Creek immediately below spring tributary flows 400 yards downstream of the discharge point of the off-stream Rotenone Neutralization Station (EFF-001)
Big Grizzly Creek	BGC-2	Big Grizzly Creek at the 30 minute travel time downstream of the discharge point of the off-stream Rotenone Neutralization Station (EFF-001)
Big Grizzly Creek	BGC-3	Big Grizzly Creek at the 60 minute travel time downstream of the discharge point of the off-stream Rotenone Neutralization Station (EFF-001)
Big Grizzly Creek	BGC-4	
Big Grizzly Creek	BGC-5	Big Grizzly Creek at the 60 minute travel time downstream of the discharge point of the off-stream Rotenone Neutralization Station

## III.

**INFLUENT MONITORING REQUIREMENTS FOR NEUTRALIZATION OPTION 1.** Not applicable

**IV. INFLUENT MONITORING REQUIREMENTS FOR NEUTRALIZATION OPTION 2.**

**A. Monitoring Location INF-001**

1. The Discharger shall monitor influent to the off-stream rotenone neutralization system at INF-001 as follows:

**Table E-2. Influent Monitoring**

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Rotenone (active ingredient)	ug/l	grab	4/day <sup>1</sup>	Dawson et al. 1983
Rotenolone	ug/l	grab	4/day <sup>1</sup>	Dawson et al. 1983
1-Methyl-2-pyrrolidinone (Methyl pyrrolidone)	ug/l	grab	every 2 days	EPA 8015 or LCMS
Diethylene glycol monoethyl ether (Diethylene glycol ethyl ether)	ug/l	grab	every 2 days	EPA 8015b or LCMS
1,3,5-Trimethylbenzene (mesitylene)	ug/l	grab	every 2 days	EPA 8260
sec-Butylbenzene	ug/l	grab	every 2 days	EPA 8260
1-Butylbenzene (n-Butylbenzene)	ug/l	grab	every 2 days	EPA 8260
4-Isopropyltoluene (p-Isopropyltoluene)	ug/l	grab	every 2 days	EPA 8260
Toluene	ug/l	grab	every 2 days	EPA 8260
1,3- and/or 1,4-Xylene (M/p xylene)	ug/l	grab	every 2 days	EPA 8260
1,2-Xylene(o xylene)	ug/l	grab	every 2 days	EPA 8260
Isopropylbenzene	ug/l	grab	every 2 days	EPA 8260
1-Propylbenzene(n-Propylbenzene)	ug/l	grab	every 2 days	EPA 8260
1,2,4-Trimethylbenzene	ug/l	grab	every 2 days	EPA 8260
Trichloroethene (aka Trichloroethylene)	ug/l	grab	every 2 days	EPA 8260
Methylnaphthalene	ug/l	grab	every 2 days	EPA 8270
Naphthalene	ug/l	grab	every 2 days	EPA 8270

<sup>1</sup>These constituents shall be monitoring 4 times/day for the first week, three times per day for the second week, and twice a day thereafter.

**V. DISCHARGE MONITORING FOR NEUTRALIZATION OPTION 1**

- A. Seepage from the toe drains at Grizzly Valley Dam shall be monitored at Monitoring Location SEEP-001 as follows:

**Table E-3. Discharge Monitoring For Neutralization Option 1**

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	gpm	grab	1/day	
Rotenone (active ingredient)	ug/l	grab	1/day	Dawson et al. 1983
Rotenolone	ug/l	grab	1/day	Dawson et al. 1983

1-Methyl-2-pyrrolidinone (Methyl pyrrolidone)	ug/l	grab	1/week	EPA 8015b or LCMS
Diethylene glycol monoethyl ether (Diethylene glycol ethyl ether)	ug/l	grab	1/week	EPA 8015b or LCMS
1,3,5-Trimethylbenzene (mesitylene)	ug/l	grab	1/week	EPA 8260
sec-Butylbenzene	ug/l	grab	1/week	EPA 8260
1-Butylbenzene (n-Butylbenzene)	ug/l	grab	1/week	EPA 8260
4-Isopropyltoluene (p-Isopropyltoluene)	ug/l	grab	1/week	EPA 8260
Toluene	ug/l	grab	1/week	EPA 8260
1,3- and/or 1,4-Xylene (M/p xylene)	ug/l	grab	1/week	EPA 8260
1,2-Xylene(o xylene)	ug/l	grab	1/week	EPA 8260
Isopropylbenzene	ug/l	grab	1/week	EPA 8260
1-Propylbenzene(n-Propylbenzene)	ug/l	grab	1/week	EPA 8260
1,2,4-Trimethylbenzene	ug/l	grab	1/week	EPA 8260
Trichloroethene (aka Trichloroethylene)	ug/l	grab	1/week	EPA 8260
Methylnaphthalene	ug/l	grab	1/week	EPA 8270
Naphthalene	ug/l	grab	1/week	EPA 8270

## VI. DISCHARGE MONITORING REQUIREMENTS FOR NEUTRALIZATION OPTION 2

### A. Monitoring Location EFF-001

1. The Discharger shall monitor the discharge from the off-stream Rotenone Neutralization System at EFF-001 as follows.

**Table E-4. Discharge Monitoring For Neutralization Option 2**

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	gpm	meter	continuous	
Rotenone (active ingredient)	ug/l	grab	2/day	Dawson et al. 1983
Rotenolone	ug/l	grab	2/day	Dawson et al. 1983
1-Methyl-2-pyrrolidinone (Methyl pyrrolidone)	ug/l	grab	every 2 days	EPA 8015b or LCMS
Diethylene glycol monoethyl ether (Diethylene glycol ethyl ether)	ug/l	grab	every 2 days	EPA 8015b or LCMS
1,3,5-Trimethylbenzene (mesitylene)	ug/l	grab	every 2 days	EPA 8260
sec-Butylbenzene	ug/l	grab	every 2 days	EPA 8260
1-Butylbenzene (n-Butylbenzene)	ug/l	grab	every 2 days	EPA 8260
4-Isopropyltoluene (p-Isopropyltoluene)	ug/l	grab	every 2 days	EPA 8260
Toluene	ug/l	grab	every 2 days	EPA 8260
1,3- and/or 1,4-Xylene (M/p	ug/l	grab	every 2 days	EPA 8260

xylene)				
1,2-Xylene(o xylene)	ug/l	grab	every 2 days	EPA 8260
Isopropylbenzene	ug/l	grab	every 2 days	EPA 8260
1-Propylbenzene(n-Propylbenzene)	ug/l	grab	every 2 days	EPA 8260
1,2,4-Trimethylbenzene	ug/l	grab	every 2 days	EPA 8260
Trichloroethene (aka Trichloroethylene)	ug/l	grab	every 2 days	EPA 8260
Methylnaphthalene	ug/l	grab	every 2 days	EPA 8270
Naphthalene	ug/l	grab	every 2 days	EPA 8270
Potassium Permanganate	mg/l	grab/continuous	1/hour <sup>1</sup>	Colormetric

<sup>1</sup>If a continuous monitoring device is not used, then grab samples shall be obtained every hour

2. Live cars with rainbow trout shall be placed at the end of the off-stream rotenone neutralization system and checked for survival a minimum of every 4 hours. In the event the majority of the fish die, the effluent shall immediately be sampled for all the constituents contained in Table E-4 above.

## VII. DISCHARGE MONITORING REQUIREMENTS FOR NEUTRALIZATION OPTIONS 3 AND 4.

### A. Monitoring Location BCG-1

1. The Discharger shall monitoring the discharge from Grizzly Valley Dam BCG-1 as follows:

**Table E-5. Grizzly Valley Dam Discharge Monitoring**

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Rotenone (active ingredient)	ug/l	grab	4/day <sup>1</sup>	Dawson et al. 1983
Rotenolone	ug/l	grab	4/day <sup>1</sup>	Dawson et al. 1983
1-Methyl-2-pyrrolidinone (Methyl pyrrolidone)	ug/l	grab	every 2 days	EPA 8015b
Diethylene glycol monoethyl ether (Diethylene glycol ethyl ether)	ug/l	grab	every 2 days	EPA 8015b
1,3,5-Trimethylbenzene (mesitylene)	ug/l	grab	every 2 days	EPA 8260
Sec-Butylbenzene	ug/l	grab	every 2 days	EPA 8260
1-Butylbenzene (n-Butylbenzene)	ug/l	grab	every 2 days	EPA 8260
4-Isopropyltoluene (p-Isopropyltoluene)	ug/l	grab	every 2 days	EPA 8260
Toluene	ug/l	grab	every 2 days	EPA 8260
1,3- and/or 1,4-Xylene (M/p xylene)	ug/l	grab	every 2 days	EPA 8260
1,2-Xylene(o xylene)	ug/l	grab	every 2 days	EPA 8260
Isopropylbenzene	ug/l	grab	every 2 days	EPA 8260
1-Propylbenzene(n-Propylbenzene)	ug/l	grab	every 2 days	EPA 8260
1,2,4-Trimethylbenzene	ug/l	grab	every 2 days	EPA 8260
Trichloroethene (aka Trichloroethylene)	ug/l	grab	every 2 days	EPA 8260
Methylnaphthalene	ug/l	grab	every 2 days	EPA 8270
Naphthalene	ug/l	grab	every 2 days	EPA 8270

<sup>1</sup>These constituents shall be monitoring 4 times/day for the first week, three times per day for the second week, and twice a day thereafter.

**VIII LAND DISCHARGE MONITORING REQUIREMENTS.** Not applicable

**IX. RECLAMATION MONITORING REQUIREMENTS.** Not applicable

**X. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER**

**A. Monitoring for Neutralization Option 1**

1. Receiving water monitoring location BGC-1(providing water is present) shall be monitored as follows:

**Table E-6. Receiving Water Monitoring Requirements For Option 1**

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	gpm	Instantaneous measurement	1/week	
Rotenone (active ingredient)	ug/l	grab	1/week	Dawson et al. 1983
Rotenolone	ug/l	grab	1/week	Dawson et al. 1983
1,3,5-Trimethylbenzene (mesitylene)	ug/l	grab	1/week	EPA 8260
sec-Butylbenzene	ug/l	grab	1/week	EPA 8260
1-Butylbenzene (n-Butylbenzene)	ug/l	grab	1/week	EPA 8260
4-Isopropyltoluene (p-Isopropyltoluene)	ug/l	grab	1/week	EPA 8260
Toluene	ug/l	grab	1/week	EPA 8260
1,3- and/or 1,4-Xylene (M/p xylene)	ug/l	grab	1/week	EPA 8260
1,2-Xylene(o xylene)	ug/l	grab	1/week	EPA 8260
Isopropylbenzene	ug/l	grab	1/week	EPA 8260
1-Propylbenzene(n-Propylbenzene)	ug/l	grab	1/week	EPA 8260
1,2,4-Trimethylbenzene	ug/l	grab	1/week	EPA 8260
Trichloroethene (aka Trichloroethylene)	ug/l	grab	1/week	EPA 8260
Methylnaphthalene	ug/l	grab	1/week	EPA 8270
Naphthalene	ug/l	grab	1/week	EPA 8270
1-Methyl-2-pyrrolidinone (Methyl pyrrolidone)	ug/l	grab	1/week	EPA 8015b or LCMS
Diethylene glycol monoethyl ether (Diethylene glycol ethyl ether)	ug/l	grab	1/week	EPA 8015b or LCMS

2. Live cars with rainbow trout shall be placed in Big Grizzly Creek at BGC-1.5b and observed for survival a minimum 4 times per day. In the event of greater than 50% mortality of the fish in the live cars at Monitoring Location BGC-1.5b die, the provision of IX.B.3.b. below shall be immediately implemented.

### B. Monitoring for Neutralization Option 2

1. The Discharger shall monitor Grizzly Creek at BGC-1.5a and BGC-1.5b as follows:

**Table E-7. Receiving Water Monitoring Requirements Immediately Downstream of Discharge From Treatment System (BGC-1.5A)**

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	gpm	Instantaneous measurement	2/day	
Rotenone (active ingredient)	ug/l	grab	1/day	Dawson et al. 1983
Rotenolone	ug/l	grab	1/day	Dawson et al. 1983
1-Methyl-2-pyrrolidinone (Methyl pyrrolidone)	ug/l	grab	1/day	EPA 8015b or LCMS
Potassium Permanganate	mg/l	grab	4/day	Colormetric

2. Live cars with rainbow trout shall be placed in Big Grizzly Creek at each monitoring location and observed for survival a minimum 4 times per day. In the event of greater than 50% mortality of the fish in the live cars at Monitoring Location BGC-1.5a die, the provision of IX.B.3.b. below shall be immediately implemented.

**Table E-8. Receiving Water Monitoring Requirements 400 Yards Downstream of Grizzly Valley Dam (BGC-1.5B)**

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	gpm	Instantaneous measurement	2/day	
Naphthalene	ug/l	grab	1/day	EPA 8270
Diethylene glycol monoethyl ether (Diethylene glycol ethyl ether)	ug/l	grab	1/day	EPA 8015b or LCMS
Remaining VOCs and SVOCs listed in Table F-2	ug/l	grab	weekly	EPA 8260 EPA 8270

### 3. Monitoring Location BGC-2 and BGC-3

The Discharger shall monitor Big Grizzly Creek at BGC-2 and BGC-3 as follows:

- a. Live cars containing rainbow trout shall be placed at each monitoring station and observed for survival a minimum 4 times per day.
- b. In the event of greater than 50% mortality of the fish in the live car at Monitoring location BGC-1.5a die, monitoring shall immediately be

implemented at Monitoring Locations BGC-1.5b, BCG-2 and BCG-3 for the constituents and at the frequency contained in Table E-6 above.

**C. Monitoring for Neutralization Options 3 and 4**

1. The Discharger shall monitor Grizzly Creek at BGC-4 and 5 as follows:

**Table E-9. Receiving Water Monitoring Requirements 30 and 60 Minutes Travel Time Distance From Application Point Of Neutralization Agent (BGC-4 and 5)**

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	gpm	Instantaneous measurement	2/day	
Rotenone (active ingredient)	ug/l	grab	1/day	Dawson et al. 1983
Rotenolone	ug/l	grab	1/day	Dawson et al. 1983
1-Methyl-2-pyrrolidinone (Methyl pyrrolidone)	ug/l	grab	1/day	EPA 8015b
Naphthalene	ug/l	grab	1/day	EPA 8270
Diethylene glycol monoethyl ether (Diethylene glycol ethyl ether)	ug/l	grab	1/day	EPA 8015b
Potassium Permanganate	mg/l	grab	4/day	Colormetric
Remaining VOCs and SVOCs listed in Table F-2	ug/l	grab	weekly	EPA 8260 EPA 8270

2. Live cars with rainbow trout shall be placed in Big Grizzly Creek at each monitoring location and observed for survival a minimum 4 times per day. In the event of greater than 50% mortality of the fish in the live cars at Monitoring Location BGC-4 die, the Discharger shall contact the Regional Water Board by phone as soon as practical but no later than eight hours after the event. The Discharger shall take all necessary measures to assure toxicity does not extend to BGC-5 and to return the creek to no toxicity at BGC-4 as soon as practical.

**D. Long Term Monitoring of Big Grizzly Creek**

Water Quality Objectives for constituents based on Taste and Odor (i.e. Naphthalene) in this permit are based on a rolling average annual concentration. This is appropriate for Big Grizzly Creek as the mitigations proposed by the Discharger include providing replacement water supplies as necessary for entities using Big Grizzly Creek for domestic water. In order to develop the average annual concentration, monitoring for formulation constituents must continue until a minimum of a full year of data is collected and the results averaged over the previous 12 months.

The following monitoring must be performed in Big Grizzly Creek at Location BGC-1.5B for the constituents and at the frequency shown if Neutralization Options 1 or 2 are implemented. In the event Neutralization Options 3 or 4 are implemented, the monitoring

shall be conducted at Location BGC-5. If Monitoring Location BGC-1.5B is not accessible due to snow, high stream flows, or other hazardous conditions, monitoring may be conducted at either BGC-1 or BGC-1.5A.

**Table E-10. Long Term Receiving Water Monitoring Requirements**

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Naphthalene	ug/l	grab	1/month	EPA 8270
Diethylene glycol monoethyl ether (Diethylene glycol ethyl ether)	ug/l	grab	1/month	EPA 8015b or LCMS
Remaining VOCs and SVOCs listed in Table F-2	ug/l	grab	1/month	EPA 8260 EPA 8270

#### **E. Monitoring of Big Grizzly Creek During Treatment of Tributaries to Lake Davis**

The Discharger plans on treating the tributaries to Lake Davis approximately 15 days prior to treating Lake Davis. At the initiation of the treatment of the tributaries, the following constituents shall be monitored at the frequencies shown at Monitoring Location following monitoring BGC-1. Monitoring shall continue at this location until the treatment of Lake Davis is initiated, then the applicable monitoring described above will be implemented.

**Table E-11. Receiving Water Monitoring Requirements at BGC-1 During Tributary Treatment**

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	gpm	Instantaneous measurement	1/week	
Rotenone (active ingredient)	ug/l	grab	1/week	Dawson et al. 1983
Rotenolone	ug/l	grab	1/week	Dawson et al. 1983
1,3,5-Trimethylbenzene (mesitylene)	ug/l	grab	1/week	EPA 8260
sec-Butylbenzene	ug/l	grab	1/week	EPA 8260
1-Butylbenzene (n-Butylbenzene)	ug/l	grab	1/week	EPA 8260
4-Isopropyltoluene (p-Isopropyltoluene)	ug/l	grab	1/week	EPA 8260
Toluene	ug/l	grab	1/week	EPA 8260
1,3- and/or 1,4-Xylene (M/p xylene)	ug/l	grab	1/week	EPA 8260
1,2-Xylene(o xylene)	ug/l	grab	1/week	EPA 8260
Isopropylbenzene	ug/l	grab	1/week	EPA 8260
1-Propylbenzene(n-Propylbenzene)	ug/l	grab	1/week	EPA 8260
1,2,4-Trimethylbenzene	ug/l	grab	1/week	EPA 8260

Trichloroethene (aka Trichloroethylene)	ug/l	grab	1/week	EPA 8260
Methylnaphthalene	ug/l	grab	1/week	EPA 8270
Naphthalene	ug/l	grab	1/week	EPA 8270
1-Methyl-2-pyrrolidinone (Methyl pyrrolidone)	ug/l	grab	1/week	EPA 8015b or LCMS
Diethylene glycol monoethyl ether (Diethylene glycol ethyl ether)	ug/l	grab	1/week	EPA 8015b or LCMS

## XI OTHER MONITORING REQUIREMENTS

### A. MUNICIPAL WATER SUPPLY

The Discharger is required to work in cooperation with Department of Health Services (DHS) to monitor Lake Davis and nearby domestic water wells to assure there are no short or long term health effects of the rotenone formulations on the drinking water supply as set forth in the document titled *Pike Eradication Project, Determination of the Impact on the Water Quality of Lake Davis and Adjoining Wells*, dated May 2007 and included as Attachment E-2.

- B. Disposal of Fish Carcasses.** At the end of the project, the amount of dead fish, in pounds or tons, collected from Lake Davis and transported to the selected disposal facility must be reported to the Regional Board.

## XII. REPORTING REQUIREMENTS

### A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.
2. The Discharger shall notify the Regional Water Board via telephone within six hours of discovery of toxicity in Big Grizzly Creek as evidenced by the death of the majority of fish in each live car, detection of rotenone or rotenolone above the respective detection limits or the detection of potassium permanganate greater than 1.8 mg/l. Written notification shall be submitted within 48 hours of the exceedances along with a description of the events and what actions have been undertaken to prevent a recurrence.
3. The Discharger shall report to the Regional Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986.
4. **Reporting Protocols.** The Discharger shall report with each sample result the applicable Reporting Level (RL) and the current Method Detection Limit (MDL), as determined by the procedure in Part 136.

The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

- a. Sample results greater than or equal to the RL shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).
- b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy ( $\pm$  a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

- c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.
- d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve.

## **B. Self Monitoring Reports (SMRs)**

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (<http://www.waterboards.ca.gov/ciwqs/index.html>). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.
2. Monitoring results shall be submitted to the Regional Water Board by the **first day** of the second week following sample collection.
3. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, and removal efficiencies (%) for BOD and Total Suspended Solids, shall be determined and recorded as needed to demonstrate compliance.

4. With the exception of flow, all constituents monitored on a continuous basis (metered), shall be reported as daily maximums, daily minimums, and daily averages; flow shall be reported as the total volume discharged per day for each day of discharge.
5. If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.
6. A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions.
7. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

Regional Water Quality Control Board  
Central Valley Region  
415 Knollcrest Dr., Suite #100  
Redding, CA 96002

8. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

**Table E-12. Monitoring Periods and Reporting Schedule**

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period	SMR Due Date
Continuous	Day rotenone is added to Lake Davis or day off-stream rotenone neutralization system becomes operational, as applicable	All	Submit with weekly SMR
1/hour	Hour rotenone is added to Lake Davis or hour off-stream rotenone neutralization system becomes operational, as applicable	Samples shall be collected spaced as close to 1 hour apart as possible.	
1/Day	Day rotenone is added to Lake Davis or day off-stream rotenone neutralization system becomes operational, as applicable	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	Submit with weekly SMR

2/day, 4/day	Day rotenone is added to Lake Davis	Samples shall be evenly spaced over a 24 hour period.	Submit with weekly SMR
Every 2 days	Day off-stream rotenone neutralization system becomes operational, as applicable	Samples shall be spaced as close to 48 hours apart as possible.	
1/Week	Day rotenone is added to Lake Davis	Sunday through Saturday	Submit with weekly SMR
Monthly	May begin first day of calendar month following permit effective date, but no later that the day rotenone is added to Lake Davis.	1 <sup>st</sup> day of calendar month through last day of calendar month	Submit no later than 30 days from the end of the month in which the sample was taken.

### C. Discharge Monitoring Reports (DMRs)

1. As described in Section X.B.1 above, at any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.
2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharge shall submit the original DMR and one copy of the DMR to the address listed below:

State Water Resources Control Board  
Discharge Monitoring Report Processing Center  
Post Office Box 671  
Sacramento, CA 95812

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated or modified cannot be accepted.

### D. Other Reports

1. **Project Operations Report.** No later than **90 days** after DHS has determined Lake Davis meets applicable standards to return to use as a municipals water supply, the Discharger shall submit a written report to the Executive Officer containing both tabular and graphical summaries of the monitoring data obtained during the project, including data collected on water quality in Lake Davis, adjoining wells, the Rotenone Neutralization System, and Big Grizzly Creek. The report shall discuss the compliance record, if violations have occurred and for how long, and include corrective actions taken to bring the discharge into full compliance with the waste discharge requirements.

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## ATTACHMENT F – FACT SHEET

As described in section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

This Order has been prepared under a standardized format to accommodate a broad range of discharge requirements for Dischargers in California. Only those sections or subsections of this Order that are specifically identified as “not applicable” have been determined not to apply to this Discharger. Sections or subsections of this Order not specifically identified as “not applicable” are fully applicable to this Discharger.

### I. PERMIT INFORMATION

The following table summarizes administrative information related to the facility.

**Table F-1. Facility Information**

<b>WDID</b>	
<b>Discharger</b>	California Department of Fish and Game
<b>Name of Facility</b>	Lake Davis Pike Eradication Project, Portola
<b>Facility Address</b>	Lake Davis, County Road 126
	Portola, CA 96122
	Plumas County
<b>Facility Contact, Title and Phone</b>	Dr. Ed Pert, Project Manager, (916) 653-7889
<b>Authorized Person to Sign and Submit Reports</b>	Dr. Ed Pert, Project Manager, (916) 653-7889
<b>Mailing Address</b>	1416 Ninth Street, Sacramento, CA 95814
<b>Billing Address</b>	SAME
<b>Type of Facility</b>	Man-made lake
<b>Major or Minor Facility</b>	Minor
<b>Threat to Water Quality</b>	1
<b>Complexity</b>	A
<b>Pretreatment Program</b>	N
<b>Reclamation Requirements</b>	Not applicable
<b>Facility Permitted Flow</b>	1.3 mgd
<b>Facility Design Flow</b>	1.3 mgd
<b>Watershed</b>	Middle Fork Feather River (Hydraulic Unit 518.33)
<b>Receiving Water</b>	Big Grizzly Creek
<b>Receiving Water Type</b>	Inland Surface Water

- A. The California Department of Fish and Game (hereinafter Discharger) is proposing to eradicate the highly predacious, non-native northern pike from Lake Davis in Plumas County by poisoning the entire lake with the pesticide rotenone. Lake Davis is part of the State Water Project controlled by the California Department of Water Resources

and surrounded by land administered by the U.S. Department of Agriculture, Forest Service.

For the purposes of this Order, references to the “discharger” or “permittee” in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

- B.** The Discharger proposes to discharge treated water to Big Grizzly Creek, a water of the United States.
- C.** The Discharger filed a report of waste discharge and submitted an application for Waste Discharge Requirements (WDRs) and a National Pollutant Discharge Elimination System (NPDES) permit on 11 November 2006. Supplemental information was requested on 6 December 2006 and received on 27 December 2006.

## **II. FACILITY DESCRIPTION**

Lake Davis is a State Water Project reservoir located in eastern Plumas County and the Plumas National Forest, approximately 6 miles upstream of the confluence of Big Grizzly Creek with the Middle Fork Feather River. Lake Davis is in the Lake Davis Hydrologic Unit (No. 518.34) and was formed from the impoundment of Big Grizzly Creek, tributary to the Middle Fork Feather River (Hydrologic Unit No. 518.33). The lake covers all or parts of Sections 16, 17, 19, 20, 21, 22, 26, 27, 28, 29, 33, 34, & 35, T24N, R13E, and Sections 1, 2, 3, & 11, T23N, R13E, MDB&M. Attachment B provides a map of Lake Davis, Grizzly Valley Dam, and the upper portion of Big Grizzly Creek.

Lake Davis is operated by the California Department of Water Resources consistent with its primary purposes of recreation, fish and wildlife enhancement, and water supply. The spillway elevation of the reservoir is 5,775 feet, which provides a capacity of approximately 84,000 acre-feet and a surface area of 4,000 surface acres. Lake Davis is currently managed to operate well below its capacity primarily to minimize the potential for pike escapement over the spillway.

### **HISTORY**

Northern pike were first observed in Lake Davis in 1994. As a result, the Discharger implemented an eradication project in 1997 which included preparation of an EIR to evaluate and select appropriate management actions (DFG 1997). In October 1997, the Discharger treated Lake Davis with Nusyn-Noxfish, a rotenone formulation that contained, among other compounds, the synergist piperonyl butoxide. While the other components of the Nusyn-Noxfish degraded relatively rapidly, the piperonyl butoxide remained for many months, causing concerns over use of the lake for municipal and domestic water supply. Pike were rediscovered in Lake Davis in 1999. These pike either survived the 1997 treatment or were illegally reintroduced into the reservoir.

The Discharger has attempted several methodologies over the years to control the pike population in Lake Davis or to contain the pike in Lake Davis. These attempts include 1) the use of detonation cord to stun or kill pike in the lake, 2) installation of grate barriers to

prevent pike movement into upstream tributaries, 3) installation of barrier/trap nets to block pike from spawning habitat, 4) encouraging angling efforts for pike to control the population, 5) the use of drag nets, purse seines, gill nets and electrofishing to reduce pike populations, and 6) the use of brown trout as a pike predator.

Containment efforts have included 1) installation of "fish graters" on the outlet structure of Lake Davis to kill fish which pass through the outlet into Little Grizzly Creek and 2) installation of high volume strainers to sieve all water leaving Lake Davis to eliminate pike eggs and later life stages.

The Discharger concluded that the pike population continues to grow despite their efforts and have decided to again attempt to eradicate the pike with chemical treatment of the pesticide rotenone.

## **PROJECT DESCRIPTION**

Lake Davis has a total capacity of 84,371 acre-feet. The rotenone treatment is planned to take place when the lake is between 48,000 and 45,000 acre-feet, or as low as 38,000 acre-feet if the higher level cannot be maintained. The application is planned for sometime in the fall when the lake temperature stratification is minimal to aid in the complete mixing of the rotenone. However, the project must be completed before water temperatures fall too low which can reduce the effectiveness of the rotenone and extend the time period for the natural breakdown of the rotenone and other formulation constituents. The pesticide would be applied throughout the reservoir and shoreline, tributary streams; and to any pools, ponds, or springs in the watershed potentially containing pike.

### **Rotenone**

Rotenone is a naturally occurring pesticide found in the roots of certain plants. It is used for insect control and for fisheries management. Rotenone acts by interfering with oxygen use. It is especially toxic to fish because it is readily absorbed through the gills. The Department of Pesticide Regulation (DPR) regulates rotenone as a restricted material. Commercial rotenone formulations contain certain "inert" ingredients (solvents, dispersants, emulsifiers, etc.) as well as the active ingredient rotenone. Two commercially available five percent rotenone liquid formulations (CFT Legumine and NoxFish) are proposed for use, both registered for use in California. The formulations and the approximate concentrations of each compound expected in Lake Davis are contained in the table below.

**Table F-2 Chemicals Detected In Rotenone Formulations Proposed For Use In Lake Davis Project Area**

International (CAS), National (EPA-RC) and State (CDPR) Registration Codes, and Required Analytical Test Methods and Detection Limits (Modified from Table 14.1-1 *Final EIR/EIS for the Lake Davis Pike Eradication Project*, and Table 1, *Pike Eradication Project, Determination of the Impact on the Water Quality of Lake Davis and Adjoining Wells*, DHS)

Chemical Name	Estimated Concentration in Treatment <sup>1</sup>	CAS #	EPA-PC #	CDPR Chemical Code	Required Analytical Test Method	Detection Limit (ug/l)
<b>CFT Legumine® Formulation</b>						
Rotenone (active ingredient)	42.1 µg/L	83-79-4	071003	518	Dawson et al. 1983	2
Rotenolone	5.2 µg/L	None	None	4095	Dawson et al. 1983	2
1-Methyl-2-pyrrolidinone (Methyl pyrrolidone)	87.8 µg/L	872-50-4	--	--	EPA 8015b or LCMS	5
Diethylene glycol monoethyl ether (Diethylene glycol ethyl ether)	581.1 µg/L	111-90-0	011504	2505	EPA 8015b or LCMS	5
1,3,5-Trimethylbenzene (mesitylene)	0.004 µg/L	108-67-8	None	5884	EPA 8260	0.1
sec-Butylbenzene	0.004 µg/L	135-98-8	--	--	EPA 8260	0.3
1-Butylbenzene (n-Butylbenzene)	0.078 µg/L	104-51-8	--	--	EPA 8260	0.3
4-Isopropyltoluene (isopropyltoluene)	0.005 µg/L	98-87-6	--	--	EPA 8260	0.3
Methylnaphthalene	0.136 µg/L	1321-84-4	054002	942	EPA 8270	0.5
Naphthalene	0.341 µg/L	91-20-3	055801	421	EPA 8270	0.5
<b>NoxFish® Formulation</b>						
Rotenone (active ingredient)	48.81 µg/L	83-79-4	071003	518	Dawson et al. 1983	2
Rotenolone	14.641 µg/L	None	None	4095	Dawson et al. 1983	2
Trichloroethene (aka Trichloroethylene)	0.071 µg/L	79-01-6	081202	595	EPA 8260	0.5
Toluene	1.757 µg/L	108-88-3	080601	1281	EPA 8260	0.5
1,3- and/or 1,4-Xylene (M/p xylene)	0.595 µg/L	108-38-3/106-42-3	--	--	EPA 8260	0.5
1,2-Xylene(o xylene)	0.074 µg/L	1330-20-7	086802	622	EPA 8260	0.5
Isopropylbenzene	0.050 µg/L	98-82-8	None	3116	EPA 8260	0.1
1-Propylbenzene(n-Propylbenzene)	0.303 µg/L	103-65-1	--	--	EPA 8260	0.2
1,3,5-Trimethylbenzene (mesitylene)	0.839 µg/L	108-67-8	None	5884	EPA 8260	0.1
1,2,4-Trimethylbenzene	9.761 µg/L	95-63-6	None	5883	EPA 8260	0.2

1-Butylbenzene (n-Butylbenzene)	8.785 µg/L	104-51-8	--	--	EPA 8260	0.3
4-Isopropyltoluene (p-Isopropyltoluene)	0.976 µg/L	98-87-6	--	--	EPA 8260	0.3
Naphthalene	68.326 µg/L (w/ EPA 8260)	91-20-3	055801	421	EPA 8270	0.5
<b>Potassium Permanganate (for Rotenone Neutralization)</b>						
Potassium permanganate	4 mg/L-water	7722-64-7	068501	498	Colormetric	0.1

<sup>1</sup>Based on chemical analysis of commercial formulations and proposed treatment concentration of 1 mg-formulation/L receiving water, concentrations will vary by lot by approximately 10 percent. Data listed from DFG Pesticide Laboratory Reports (CFT Legumine®: report date 7/7/04, lab no P-2399; Noxfish®: report date 7/9/02, Lab Nos P-2297, 2298, 2300, 2302).

-- No data available

The active ingredient rotenone and some of the “inert” ingredients are potentially toxic chemicals. Chemical concentration, duration, and route of exposure must all be considered in determining potential risk to non-target organisms. At the concentrations proposed for the Lake Davis Pike Eradication Project, the rotenone formulations will be toxic to gill breathing organisms such as fish and amphibians in aquatic life stages, and some invertebrates with gills or with gill containing life stages during the poisoning event. There is no evidence of adverse effects to humans or terrestrial wildlife such as deer from incidental contact (for example, through drinking water) with rotenone formulation ingredients applied to surface waters at concentrations typical of fishery management projects.

Under normal field conditions (water temperature greater than 5°C), when applied to water, rotenone breaks down naturally within approximately 14 to 28 days. It can also be detoxified by oxidation with potassium permanganate or chlorine. It binds readily to organic matter in soil. Consequently, it does not persist as a pollutant in groundwater. Inert ingredients are generally volatile compounds that are expected to dissipate within two weeks. Two constituents in the CFT Legumine formulation, Methyl Pyrrolidone and Diethylene glycol ethyl ether are considered semi-volatile compounds and are highly soluble in water. Therefore they may take longer to degrade.

Two commercially available five percent rotenone liquid formulations (CFT Legumine and Noxfish) are proposed for use, both registered for use in California. The Discharger is not considering the 2.5 percent liquid rotenone formulation Nusyn-Noxfish® because during the previous treatment in 1997 the synergist (piperonyl butoxide) persisted longer than anticipated. The 5 percent rotenone formulation would be applied at a resulting concentration of 1 milligram (mg) formulation per liter of water (one part per million [1 ppm]), which equates to 0.33 gallons of pesticide product per acre-foot of water (an acre-foot equals about 325,850 gallons). This treatment rate of 1 ppm formulation equates to 50 micrograms (µg) of rotenone per liter of water (50 parts per billion [ppb] of rotenone). The proposed project is to apply a liquid formulation in both the reservoir and in the tributaries.

The total amount of Noxfish or CFT Legumine used would vary based on reservoir volume and inflow at time of application. At the application rate of 0.33 gallons of Noxfish or CFT Legumine per acre-foot of water, a 48,000 acre-feet reservoir volume would require

about 16,000 gallons of the formulation. About two hundred gallons are expected to be required for each treatment of the tributaries during a normal water year, and two treatments are assumed. However, due to 2006-07 being a very low water year, many tributaries are expected to be dry or have very low flows. It is possible that as little as 100 gallons of rotenone will be required to treat the tributaries with approximately 5 gallons actually entering the lake from the tributaries. The precise amount would depend on flow rates, background demand, sedimentation, amount of vegetation, duration of application, construction of temporary upstream fish barriers, and other factors.

## **A. Description of Treatment or Controls**

### **Neutralization Options /Environmental Fate of Rotenone and other Formulation Ingredients**

The purpose of the Lake Davis Pike Eradication Project is to eliminate all pike in Lake Davis by using the pesticide rotenone. The use of rotenone formulations will also impact other aquatic life in the lake, including non-target fish and some invertebrates with gills or with gill containing life stages during the poisoning event. The rotenone formulations often contain other carrier solvents generally classified as “volatile organic compounds” (VOCs) and “semi-volatile organic compounds” (SVOCs) to aid in the solubility, distribution and emulsification of the active ingredient (rotenone) during application to improve efficacy. It is expected that rotenone and the other formulation ingredients will degrade naturally to non-detectable levels within several weeks after treatment.

The Discharger has proposed four options, identified as Neutralization Options 1-4 in the project documents, to neutralize the rotenone and prevent in-stream toxicity beyond the treatment area. The Options are described below.

#### **Neutralization Option 1**

Option 1 is the preferred neutralization method identified in the EIR/EIS and is the favored option by the Regional Water Board. Under Option 1, the outlet from Grizzly Valley Dam would be closed for a period up to 45 days to allow the rotenone formulation components to degrade naturally in the lake. This option would require only the collection of minor seepage from the dam toe drains, estimated at 4 gallons per minute, to be pumped or trucked back to the lake. Big Grizzly Creek would be dried up for approximately 400 yards until springs and other accretionary flows provided adequate water for support of aquatic life. No chemical neutralizing agents would be required and the downstream fisheries in Big Grizzly Creek would be protected. The Discharger has identified mitigations for reducing the water available to downstream users, however, at the time of the writing of this permit, it is not known if all necessary conditions for this option can be met.

#### **Neutralization Option 2**

Option 2 consists of off-stream treatment of Lake Davis water and its discharge into Big Grizzly Creek to allow for increased stream flows and minimize downstream impacts of low water flows. Flows from Lake Davis would be shut off for a period of five days. At

that time, a treatment system constructed on the shore below high water line of the lake upstream of the dam would treat between 0.2 and 2 cfs of water from Lake Davis with potassium permanganate, a strong oxidizer. The treated water, with no rotenone and possibly minor amounts of residual formulation ingredients would be discharged to Big Grizzly Creek. If Option 1 is not feasible, then Option 2 would be the second most preferred option of the Regional Water Board staff and is included in these Waste Discharge Requirements. The potassium permanganate would be reduced to manganese dioxide, an insoluble, non-bioavailable dark brown substance harmless to aquatic life.

### **Neutralization Option 3**

Option 3 consists of using Big Grizzly Creek itself as a necessary component of the system for neutralizing the rotenone. The outlet to Lake Davis would be closed immediately prior to the application of rotenone to Lake Davis. The outlet would remain closed for a period of five days to allow for a through mixing of the rotenone in the lake and for it to have its intended impact on the northern pike. After the five day period, the outlet would be opened to allow for a discharge of up to 2 cfs of lake water containing residual rotenone and other formulation components. Potassium permanganate would be metered into the creek immediately below the dam outlet and the rotenone and other ingredients would be oxidized to harmless compounds within 30 to 60 minutes residence time in the creek. This equates to a distance of approximately 0.4 miles which can vary depending on flow rates.

Option 3, although the typical method by which the Discharger neutralizes rotenone in its applications to streams, has many issues that make it a questionable practice for the Lake Davis Project. If the concentration of rotenone and other organic compounds discharging from the dam change, then either too much or too little potassium permanganate will be added to the stream, either instance being toxic to fish. Inherent in the method is that until the potassium permanganate can adequately neutralize the rotenone, an acutely toxic mixing zone is present in the creek for approximately 0.5 miles downstream of the point of potassium permanganate application, depending on stream flows.

### **Neutralization Option 4**

Option 4 is identical to Option 3 but with flows from Grizzly Valley Dam reaching up to 5 cfs. The disadvantages and potential problems association with this Option are magnified from those discussed in Option 3 above and the reach of stream below the dam which would exhibit acute toxicity would be increased to approximately 1 mile or 30 to 60 minutes residence time in the stream. The advantage is the increase in stream flows to Big Grizzly Creek.

## **B. Discharge Points and Receiving Waters**

1. Grizzly Valley Dam, the point of discharge and site of the proposed off-stream rotenone neutralization system, is located in the east 1/2 of the southeast 1/4, Section 2 and the west 1/2, southwest 1/4, Section 1, T23N, R13E, MDB&M, as shown in Attachment B, a part of this Order.

2. Neutralized water from the rotenone application is proposed to be discharged at the Grizzly Valley Dam spillway to Big Grizzly Creek, a water of the United States and tributary to North Fork Feather River at latitude 39° 53' 5" N and longitude 120° 28' 30" W, approximately 6 miles upstream of the confluence of Big Grizzly Creek with the Middle Fork Feather River. Lake Davis is in the Lake Davis Hydrologic Unit (No. 518.34) and was formed from the impoundment of Big Grizzly Creek, tributary to the Middle Fork Feather River (Hydrologic Unit No. 518.33).

**C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data**  
Not Applicable

**III. APPLICABLE PLANS, POLICIES, AND REGULATIONS**

The requirements contained in this Order are based on the applicable plans, policies, and regulations identified in section II of the first part of this permit (Findings). This section provides supplemental information, where appropriate, for the plans, policies, and regulations relevant to the discharge.

**A. Legal Authority**

See Findings, Section II.D.

**B. California Environmental Quality Act (CEQA)**

See Findings, Section II.F.

**C. State and Federal Regulations, Policies, and Plans**

See Findings, Section 2

1. **Water Quality Control Plans.** The Regional Water Board adopted a *Water Quality Control Plan, Fourth Edition (Revised September 2004)*, for the *Sacramento and San Joaquin River Basins* (Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, State Water Board Resolution No. 88-63 requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin Plan. The Basin Plan at page II-2.00 states that the "...beneficial uses of any specifically identified water body generally apply to its tributary streams." The Basin Plan does not specifically identify beneficial uses for Big Grizzly Creek, but does identify present and potential uses for Middle Fork Feather River from Little Last Chance Creek to Lake Oroville, to which Big Grizzly Creek is tributary. These beneficial uses are as follows: municipal and domestic supply; water contact recreation, including canoeing and rafting; non-contact water recreation, including aesthetic enjoyment; warm freshwater habitat; cold freshwater habitat; cold spawning, reproduction, and /or early development; and wildlife habitat. Although not specified in the Basin Plan for Middle Fork Feather River, Big Grizzly Creek is used as an agricultural supply, including stock watering.

The federal CWA section 101(a)(2), states: *“it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water be achieved by July 1, 1983.”* Federal Regulations, developed to implement the requirements of the CWA, create a rebuttable presumption that all waters be designated as fishable and swimmable. Federal Regulations, 40 CFR sections 131.2 and 131.10, require that all waters of the State regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shell fish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. Section 131.3(e), 40 CFR, defines existing beneficial uses as those uses actually attained after November 28, 1975, whether or not they are included in the water quality standards. Federal Regulation, 40 CFR section 131.10 requires that uses be obtained by implementing effluent limitations, requires that all downstream uses be protected and states that in no case shall a state adopt waste transport or waste assimilation as a beneficial use for *any waters of the United States*.

The Basin Plan allows the Regional Water Board, after compliance with CEQA, to allow short-term variances from Basin Plan provisions if determined to be necessary to implement control measures for fishery management conducted under statutory requirements of the Department of Fish and Game. The Department of Fish and Game certified an environmental impact report for the project. This project will result in short term excursions outside of the Basin Plan provisions for Lake Davis and its tributaries and downstream for a limited distance in Big Grizzly Creek and is consistent with the Basin Plan .

2. **Antidegradation Policy.** Section 131.12 requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California’s antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board’s Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

The temporary deterioration of water quality due to the use of rotenone and potassium permanganate by the Discharger is justifiable in certain situations providing suitable measures are taken to protect water quality within and downstream of the project area. The Regional Water Board recognizes the threat to local trout fisheries and the potential long range adverse impacts to fisheries management in the Feather River and Sacramento River Delta System. Further, the Regional Water Board recognizes that the State and federal Endangered Species Acts require the restoration and preservation of threatened and endangered species. These resources are of important economic and social value to the people of the State, and the Regional Water Board finds that

transitory degradation of water quality and short-term impairment of beneficial uses that would result from rotenone application is therefore justified and is in the best interest of the people of the State. Therefore, the discharge is consistent with the antidegradation provisions of 40 CFR section 131.12 and State Water Board Resolution 68-16.

2. **Anti-Backsliding Requirements.** Since this is the first permit for this facility, the Anti-Backsliding Requirements which reference the previous permit are not applicable.
3. **Emergency Planning and Community Right to Know Act.** Not applicable
4. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). This Order requires compliance with Best Management Practices, application specifications, discharge limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

**D. Impaired Water Bodies on CWA 303(d) List.** Not Applicable

**E. Other Plans, Policies and Regulations**

**1. Department of Health Services**

The California Department of Health Services (DHS) has regulatory authority over the introduction of rotenone into a drinking water supply, including surface waters and potentially affected groundwater. In the document titled *Determination of the Impact on the Water Quality of Lake Davis and Adjoining Wells*, DHS states:

“Health and Safety Code Section 116751 requires that DFG may not introduce a poison to a drinking water supply for purposes of fisheries management unless the State Department of Health Services (DHS) determines that the activity will not have a permanent adverse impact on the quality of the drinking water supply or wells connected to the drinking water supply. In making this determination, DHS shall 1) evaluate the short and long-term health effects of the poison on the drinking water, 2) ensure that an alternative supply of drinking water is provided to the users of the drinking water supply while the activity takes place, and, 3) in cooperation with the Department of Fish and Game, develop and implements a monitoring program to ensure that no detectable residuals of the poison, breakdown products, and other components of the poison formulation remain in the drinking water supply or adjoining wells after the activity is completed”

In the same document, DHS has determined that:

“...there will be no short-term or long-term health effects in drinking water from the proposed project because no residuals of rotenone, breakdown products, or other components of the rotenone formulations shall be detectable in Lake Davis water before the lake will be returned to service as a source of drinking water”

The Plumas County Environmental Health Department (PCEHD) has been monitoring domestic supply groundwater near Lake Davis since the last poisoning of the lake in 1997 to assure no residual formulation ingredients have impacted water quality. Based partially on the information provided by PCEHD, DHS has further determined:

“...based on the results of the 1997 treatment and the subsequent monitoring of well water that has taken place, DHS does not expect that the water quality of any of the adjoining wells will be adversely affected and, therefore, no short-term and long-term health effects will result from the proposed project.”

The Regional Water Board has reviewed the data available from the past rotenone application to Lake Davis and the documents on the hydrogeology of the Lake Davis area and concurs with this Determination.

DHS has also determined that the City’s existing water supply will be adequate to meet their demands during the period of time the lake will be unavailable as a drinking water source.

Working with the Lawrence Livermore National Laboratory, the PCEHD will complete studies of the current groundwater monitoring network to determine which wells should be part of an ongoing groundwater monitoring program. DHS and the PCEHD, working with Lawrence Livermore National Laboratory are studying the groundwater and wells in the potentially impacted area and will identify those wells which will be subject to long-term monitoring for chemicals used in the pike eradication.

In an effort to coordinate the requirements of DHS, PCEHD, and the Regional Water Board, the Discharger has developed a document combining the monitoring requirements of the agencies titled *Lake Davis Northern Pike Eradication Project 2007, Lake Davis Northern Pike Eradication Water Quality Monitoring Plan*. This plan is included as part of the Monitoring and Reporting Program (Attachment E) and is incorporated as part of this Order.

## **2. Related Aquatic Pesticide Regulations**

Pesticide formulations contain disclosed active ingredients that yield toxic effects on target organisms and may also have toxic effects on non-target organisms.

They also contain inactive or inert ingredients, as well as adjuvants. Adjuvants are compounds chosen by the discharger and added to aquatic pesticides during an application event to increase the effectiveness of the aquatic pesticides on target organisms.

According to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), U.S. EPA has sole jurisdiction of pesticide label language. Label language and any changes thereto must be approved by U.S. EPA before the product can be sold in this country. As part of the labeling process, U.S. EPA evaluates data submitted by registrants to ensure that a product used according to label instructions will cause no harm (or “adverse impact”) on non-target organisms that cannot be reduced (or “mitigated”) with protective measures or use restrictions. Registrants are required to submit data on the effects of pesticides on target pests (efficacy) as well as effects on non-target organisms. Data on non-target effects include plant effects (phytotoxicity), fish and wildlife hazards (ecotoxicity), impacts on endangered species, effects on the environment, environmental fate, breakdown products, leachability, and persistence; however, FIFRA is not necessarily as protective of water quality as the Clean Water Act (CWA). The Department of Pesticide Regulation (DPR) is responsible for reviewing the toxic effects of aquatic pesticide formulations and determining whether a pesticide is suitable for use in California’s waters through a registration process. To do this, DPR also reviews data submitted by the registrants. While DPR cannot require manufacturers to make changes in labels, DPR can refuse to register products in California unless manufacturers address unmitigated hazards by amending the pesticide label. Consequently, requirements that are specific for use in California are included in many pesticide labels that are approved by U.S. EPA.

DPR also licenses applicators of pesticides designated as a “restricted material”. To legally apply these pesticides, the applicator must be a holder of a Qualified Applicator Certificate or work under the supervision of someone who is certified. For aquatic pesticides, the qualified Applicator Certificate must have the category “aquatic”.

#### **IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS**

Effluent limitations and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge in as much as they apply to the implementation of Best Management Practices for the application and neutralization of rotenone as described IV below.

The Federal CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law [33 U.S.C., § 1311(b)(1)(C); 40 CFR, § 122.44(d)(1)]. NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met.

This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to Federal Regulations, 40 CFR Section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that *“are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.”* Federal Regulations, 40 CFR, §122.44(d)(1)(vi), further provide that *“[w]here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits.”*

The CWA requires point source discharges to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations: 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards, and 40 CFR §122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established. The Regional Water Board's Basin Plan, page IV-17.00, contains an implementation policy (*“Policy for Application of Water Quality Objectives”*) that specifies that the Regional Water Board *“will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.”* This Policy complies with 40 CFR §122.44(d)(1). With respect to narrative objectives, the Regional Water Board must establish effluent limitations using one or more of three specified sources, including (1) EPA's published water quality criteria, (2) a proposed state criterion (*i.e.*, water quality objective) or an explicit state policy interpreting its narrative water quality criteria (*i.e.*, the Regional Water Board's *“Policy for Application of Water Quality Objectives”*)(40 CFR 122.44(d)(1)(vi) (A), (B) or (C)), or (3) an indicator parameter. The Basin Plan contains a narrative objective requiring that: *“All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life”* (narrative toxicity objective). The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, discoloration, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The Basin Plan also limits chemical constituents in concentrations that adversely affect surface water beneficial uses. For waters designated as municipal, the Basin Plan specifies that, at a minimum, waters shall not contain concentrations of constituents that exceed Maximum Contaminant Levels (MCL) of CCR Title 22. The Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

## **A. Discharge Prohibitions**

1. Fisheries management using rotenone is commonly conducted in free flowing streams, often in the backcountry and designated wilderness areas where the ability to bring in large amounts of equipment is impractical and would cause extensive environmental damage. In such cases, the stream itself, below the target reach, is used as the reaction chamber for the addition of potassium permanganate and oxidation of the rotenone. Using this methodology, the stream below the target reach is commonly toxic to aquatic life for the period of the treatment. This methodology is appropriate for the circumstances. In the case of Lake Davis, there is adequate access for equipment and room to set up an off-stream rotenone neutralization system. Further, the outlet from Lake Davis can be completely shut off, allowing for total control of the rotenone treated water. Therefore, the use of Big Grizzly Creek downstream of Lake Davis as a part of the rotenone neutralizing system, where at least a half mile of creek that does not contain any target northern pike would be toxic to fish and other aquatic life is to be allowed only if Option 1 and 2 are infeasible due to circumstances outside the Discharger's control.
2. As stated in section I.G of Attachment D, Standard Provisions, this Order prohibits bypass from any portion of the treatment facility. Federal Regulations, 40 CFR 122.41 (m), define "bypass" as the intentional diversion of waste streams from any portion of a treatment facility. This section of the Federal Regulations, 40 CFR 122.41 (m)(4), prohibits bypass unless it is unavoidable to prevent loss of life, personal injury, or severe property damage. In considering the Regional Water Board's prohibition of bypasses, the State Water Board adopted a precedential decision, Order No. WQO 2002-0015, which cites the Federal Regulations, 40 CFR 122.41(m), as allowing bypass only for essential maintenance to assure efficient operation.
3. The off-stream rotenone neutralization system should be capable of oxidizing all rotenone with potassium permanganate and reducing the concentrations of the other organic formulation constituents to meet the receiving water limits at the designated locations in Big Grizzly Creek. Further, since the only flow in Big Grizzly Creek at the point of discharge will be from the treatment system, there is no assimilative capacity or mixing zone present in the stream to reduce the toxicity of any residuals in the discharge.
4. Neutralization Options 3 and 4 allow for the use of Big Grizzly Creek below Grizzly Valley Dam as part of the treatment area. The potassium permanganate neutralization agent shall be applied to Big Grizzly Creek as close to the dam discharge as practical. The residual rotenone in the dam discharge shall be neutralized and in-stream toxicity is prohibited beyond the 30 minute travel distance from the potassium permanganate application point. The Order sets forth Receiving Water Limits for protection of aquatic life that must be met at this 30 minute point. The Order will protect the beneficial use of MUN because the Discharger is required to meet drinking water standards in the stream consistent

with the Department of Health Services implementation of the state drinking water standards.

## **B. Best Management Practices-Based Effluent Limitations**

NPDES permits for discharges to surface waters must meet all applicable provisions of sections 301 and 402 of the CWA. These provisions require controls that utilize best available technology economically achievable (BAT), best conventional pollutant control technology (BCT), and any more stringent controls necessary to reduce pollutant discharge and meet water quality standards. Controls to achieve limitations on effluent constituents are generally required. Title 40, CFR section 122.44 states that if a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criterion, the permitting authority must develop effluent limits as necessary to meet water quality standards. Title 40, CFR section 122.44(k)(3) allows these effluent limits to be requirements to implement Best Management Practices (BMPs) if numeric effluent limits are infeasible. It is infeasible for the Regional Water Board to establish numeric effluent limitations in this NPDES Permit because:

1. Pesticides are products of specific formulation. Though pollutants in pesticides are discharged from a point source (or sources), they are not an “effluent” in the conventional sense of the word. A sufficient amount of the active ingredient must be discharged to achieve the target concentration that provides the intended effect. There is no point in requiring treatment to achieve effluent limits in this case.
2. The regulated discharge is the discharge of pollutants associated with the application of aquatic pesticides. These include over-applied pesticide product and pesticide residues. At what point the pesticide becomes a residue is not precisely known and varies depending on such things as target species, water chemistry, and flow.

In the application of aquatic pesticides, the exact composition of the effluent is unknown. Therefore, the effluent limitations contained in this NPDES Permit are narrative and include requirements to implement appropriate BMPs, including compliance with all pesticide label instructions. Residual pesticide constituents must meet receiving water limitations in the ‘non-target’ waterbody, Big Grizzly Creek. The BMP requirements included in the permit were obtained from the Discharger’s application, and other information provided to the Regional Water Board and are incorporated in the NPDES Permit by reference and by specific provisions. BMPs provide the flexibility necessary to establish controls to minimize the magnitude, area and duration of impacts caused by the discharge of aquatic pesticides.

The BMPs required in this permit and listed in Section IV of the Limitations and Discharge Requirements constitute BAT and BCT and will be implemented to minimize the magnitude, area and duration of impacts caused by the discharge of aquatic pesticides in the treatment area, and to allow for restoration of water quality and

protection of beneficial uses of the treated waters following completion of treatment events.

**C. Water Quality-Based Effluent Limitations (WQBELs).** Not applicable

**D. Whole Effluent Toxicity (WET),** Not applicable

**E. Final Effluent Limitations.** Not applicable

**F. Interim Effluent Limitations** Not applicable

**G. Satisfaction of Antidegradation Policy.** See Section N of the Findings

**H. Land Discharge Specifications.** Not applicable

**I. Reclamation Specifications.** Not applicable

## **V. RATIONALE FOR RECEIVING WATER LIMITATIONS**

Basin Plan water quality objectives to protect the beneficial uses of surface water and groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity, and tastes and odors. The toxicity objective requires that surface water and groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective requires that surface water and groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the maximum contaminant levels (MCLs) in Title 22, CCR. The tastes and odors objective states that surface water and groundwater shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use. Since the taste and odor limits are not a threat to human health and the Discharger has taken measures to provide a replacement water supply if necessary for anyone using Big Grizzly Creek as a domestic water supply during the project, it is appropriate to based the taste and odor limits on an annual average basis.

### **A. Applicable Beneficial Uses and Water Quality Criteria and Objectives.**

The Beneficial Uses for Big Grizzly Creek are described in Section II.I of the Findings and include municipal and domestic water supply, agriculture irrigation, including stock watering, contact and non-contact water recreation, warm and cold freshwater habitat, cold water spawning, and wildlife habitat. The Water Quality Criteria and Objectives must protect these uses. The specific criteria are discussed below.

### Reasonable Potential Analyses

1. CWA section 301 (b)(1) requires NPDES permits to include effluent limitations that achieve technology-based standards and any more stringent limitations necessary to meet water quality standards. Water quality standards include Regional Water Board Basin Plan beneficial uses and narrative and numeric water quality objectives, State Water Board-adopted standards, and federal standards, including the CTR and NTR. The Basin Plan includes numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, and tastes and odors. The narrative toxicity objective states: "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." (Basin Plan at III-8.00.) With regards to the narrative chemical constituents objective, the Basin Plan states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At minimum, "...water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)" in Title 22 of CCR. The narrative tastes and odors objective states: "Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses."
2. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Numeric Effluent Limits have been replaced in this permit with BMPs. However, Receiving Water Limits are contained in this permit to assure water quality objectives are met. All constituents expected to be present in the two rotenone formulations, based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, are listed in Table F-3 along with the respective laboratory detection limits and applicable water quality criteria. The residual from the potassium permanganate neutralizing agent will be manganese dioxide, a non-toxic, insoluble substance that occurs naturally in the earth's crust.
3. Those constituents which have the potential to contribute to an in-stream excursion above a water quality criteria listed in ***bold and italicized*** print in Table F-3. Where an applicable water quality criteria was identified, and the treatment concentration is expected to exceed that criteria, the criteria value was used as the Receiving Water Limit. Where no criteria was listed and no information was presented to assure the constituent was benign, a limit of ND or "non-detectable" was assigned to assure beneficial uses of Big Grizzly Creek were protected. All other constituents are expected to be present in Lake Davis below the detection limit and are listed in the Receiving Water Limits as "All other VOCs and Semi-Volatile VOCs" with a limit of "ND".

4. The Regional Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for those constituents listed in **bold and italics** in Table F-3. The constituents, along with the respective laboratory detection limit and water quality objective for are those found in the two rotenone formulations proposed for the project and the neutralizing agent. No other constituents are expected to be in the discharge.
5. The Regional Water Board conducted the RPA in accordance with Section 1.3 of the SIP. Although the SIP applies directly to the control of CTR priority pollutants, the State Water Board has held that the Regional Water Board may use the SIP as guidance for water quality-based toxics control.<sup>1</sup> The SIP states in the introduction “*The goal of this Policy is to establish a standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency.*” Therefore, in this Order the RPA procedures from the SIP were used to evaluate reasonable potential for both CTR and non-CTR constituents.

**Table F-3. Chemical Constituents For Each Rotenone Formulation and the corresponding International (CAS) Registration Codes, Analytical Test Method, Detection Limit, and Water Quality Criteria** (Modified from Table 14.1-1 *Final EIR/EIS for the Lake Davis Pike Eradication Project*, and Table 1, *Pike Eradication Project, Determination of the Impact on the Water Quality of Lake Davis and Adjoining Wells*, DHS)

Chemical Name	Estimated Concentration in Treatment <sup>1</sup>	CAS #	Required Analytical Test Method	Detection Limit (ug/l)	Criteria (ug/l)
<b>CFT Legumine® Formulation</b>					
<b>Rotenone (active ingredient)</b>	<b>42.1 µg/L</b>	<b>83-79-4</b>	<b>Dawson et al. 1983</b>	<b>2</b>	<b>4<sup>2</sup></b>
<b>Rotenolone</b>	<b>5.2 µg/L</b>	<b>None</b>	<b>Dawson et al. 1983</b>	<b>2</b>	<b>--</b>
<b>1-Methyl-2-pyrrolidinone (Methyl pyrrolidone)</b>	<b>87.8 µg/L</b>	<b>872-50-4</b>	<b>EPA 8015b or LCMS</b>	<b>5</b>	<b>123<sup>3</sup></b>
<b>Diethylene glycol monoethyl ether (Diethylene glycol ethyl ether)</b>	<b>581.1 µg/L</b>	<b>111-90-0</b>	<b>EPA 8015b or LCMS</b>	<b>5</b>	<b>21<sup>4</sup></b>
1,3,5-Trimethylbenzene (mesitylene)	0.004 µg/L	108-67-8	EPA 8260	0.1	15 <sup>4</sup>
sec-Butylbenzene	0.004 µg/L	135-98-8	EPA 8260	0.3	260 <sup>5</sup>
1-Butylbenzene (n-Butylbenzene)	0.078 µg/L	104-51-8	EPA 8260	0.3	260 <sup>5</sup>
4-Isopropyltoluene (isopropyltoluene)	0.005 µg/L	98-87-6	EPA 8260	0.3	--
Methylnaphthalene	0.136 µg/L	1321-84-4	EPA 8270	0.5	28 <sup>6</sup>
Naphthalene	0.341 µg/L	91-20-3	EPA 8270	0.5	21 <sup>4</sup>
<b>NoxFish® Formulation</b>					
<b>Rotenone (active ingredient)</b>	<b>48.81 µg/L</b>	<b>83-79-4</b>	<b>Dawson et al. 1983</b>	<b>2</b>	<b>4<sup>2</sup></b>
<b>Rotenolone</b>	<b>14.641 µg/L</b>	<b>None</b>	<b>Dawson et al. 1983</b>	<b>2</b>	<b>--</b>
Trichloroethene (aka Trichloroethylene)	0.071 µg/L	79-01-6	EPA 8260	0.5	2.7 <sup>7</sup>
Toluene	1.757 µg/L	108-88-3	EPA 8260	0.5	40 <sup>8</sup>
1,3- and/or 1,4-Xylene (M/p xylene)	0.595 µg/L	108-38-3/ 106-42-3	EPA 8260	0.5	20 <sup>8</sup>
1,2-Xylene(o xylene)	0.074 µg/L	1330-20-7	EPA 8260	0.5	20 <sup>8</sup>
Isopropylbenzene	0.050 µg/L	98-82-8	EPA 8260		0.8 <sup>4</sup>
1-Propylbenzene(n-Propylbenzene)	0.303 µg/L	103-65-1	EPA 8260		260 <sup>5</sup>
1,3,5-Trimethylbenzene (mesitylene)	0.839 µg/L	108-67-8	EPA 8260	0.1	15 <sup>4</sup>
1,2,4-Trimethylbenzene	9.761 µg/L	95-63-6	EPA 8260	0.2	330 <sup>5</sup>
1-Butylbenzene (n-Butylbenzene)	8.785 µg/L	104-51-8	EPA 8260	0.3	260 <sup>5</sup>
4-Isopropyltoluene (p-Isopropyltoluene)	0.976 µg/L	98-87-6	EPA 8260	0.3	--
<b>Naphthalene</b>	<b>68.326 µg/L (w/ EPA 8260)</b>	<b>91-20-3</b>	<b>EPA 8270</b>	<b>0.5</b>	<b>21<sup>4</sup></b>
<b>Potassium Permanganate (for Rotenone Neutralization)</b>					
<b>Potassium permanganate</b>	<b>4 mg/L-water</b>	<b>7722-64-7</b>	<b>Colorimetric</b>	<b>0.1</b>	<b>1</b>

<sup>1</sup>Based on chemical analysis of commercial formulations and proposed treatment concentration of 1 mg-formulation/L receiving water, concentrations will vary by lot by approximately 10 percent. Data listed from DFG Pesticide Laboratory Reports (CFT Legumine®: report date 7/7/04, lab no P-2399; Noxfish®: report date 7/9/02, Lab Nos P-2297, 2298, 2300, 2302).

<sup>2</sup> Notification Level listed by DHS in Table 1 of the document titled *Pike Eradication Project, Determination of the Impact on the Water Quality of Lake Davis and Adjoining Wells*

<sup>3</sup>Based on 1/10<sup>th</sup> of the 48 hour LC50.

<sup>4</sup>Taste and Odor threshold

<sup>5</sup>DHS Notification Level

<sup>6</sup>USEPA IRIS Ref Dose for a drinking water supply

<sup>7</sup>CTR criteria for human consumption of water and fish

<sup>8</sup>Secondary MCL

<sup>9</sup>Level identified as toxic to Rainbow Trout in EIR/EIS

-- No data available

**Mixing Zone.** Under Option 2 the discharge from the off-stream Rotenone Neutralization System will be direct to Big Grizzly Creek below Grizzly Valley Dam. During the project, the outlet to the dam will be shut off and there will be no flow in Big Grizzly Creek except what is discharged from the off-stream Rotenone Neutralization System. There is no assimilative capacity or mixing zone present in the stream to reduce the toxicity of any residuals in the discharge so no mixing zone is allowed for constituents which are toxic to aquatic life.

Although Big Grizzly Creek has the beneficial uses assigned for a municipal drinking water supply, there is currently no use of the creek between Grizzly Valley Dam and the tributary springs for that use. Therefore, this permit allows for the taste and odor criteria for a drinking water supply to be met below the tributary springs, approximately 400 yards downstream of Grizzly Valley Dam.

Neutralization Options 3 and 4 include the reach below Grizzly Valley Dam as part of the treatment area as described in the EIR/EIS and a mixing zone is not applicable

## **B. Surface Water**

1. CWA section 303(a-c), requires states to adopt water quality standards, including criteria where they are necessary to protect beneficial uses. The Regional Water Board adopted water quality criteria as water quality objectives in the Basin Plan. The Basin Plan states that “[t]he numerical and narrative water quality objectives define the least stringent standards that the Regional Board will apply to regional waters in order to protect the beneficial uses.” The Basin Plan includes numeric and narrative water quality objectives for various beneficial uses and water bodies. This Order contains Receiving Surface Water Limitations based on the Basin Plan numerical and narrative water quality objectives for biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, turbidity, and electrical conductivity.
  - a. **Biostimulatory Substances.** The Basin Plan includes a water quality objective that “*Water shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.*” Receiving Water Limitations for biostimulatory substances are included in this Order and are based on the Basin Plan objective.
  - b. **Color.** The Basin Plan includes a water quality objective that “*Water shall be free of discoloration that causes nuisance or adversely affects beneficial uses.*” Receiving Water Limitations for color are included in this Order and are based on the Basin Plan objective.
  - c. **\*Chemical Constituents.** The Basin Plan includes a water quality objective that “*Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.*” Receiving Water Limitations for chemical constituents are included in this Order and are based on the Basin Plan objective.

- d. **Dissolved Oxygen.** Big Grizzly Creek has been designated as having the beneficial use of cold freshwater aquatic habitat (COLD). For water bodies designated as having COLD as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/L of dissolved oxygen. Since the beneficial use of COLD does apply to Big Grizzly Creek, a receiving water limitation of 7.0 mg/L for dissolved oxygen was included in this Order.

For surface water bodies outside of the Delta, the Basin Plan includes the water quality objective that “...the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation.” This objective was included as a receiving water limitation in this Order.

- e. **Floating Material.** The Basin Plan includes a water quality objective that “Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.” Receiving Water Limitations for floating material are included in this Order and are based on the Basin Plan objective.
- f. **Oil and Grease.** The Basin Plan includes a water quality objective that “[W]aters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.” Receiving Water Limitations for oil and grease are included in this Order and are based on the Basin Plan objective.
- g. **pH.** The Basin Plan includes water quality objective that “[T]he pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses” This Order includes receiving water limitations for both pH range and pH change.

The Basin Plan allows an appropriate averaging period for pH change in the receiving stream. Since there is no technical information available that indicates that aquatic organisms are adversely affected by shifts in pH within the 6.5 to 8.5 range, an averaging period is considered appropriate and a monthly averaging period for determining compliance with the 0.5 receiving water pH limitation is included in this Order.

- h. **Pesticides.** The Basin Plan includes a water quality objective for pesticides beginning on page III-6.00. Receiving Water Limitations for pesticides are included in this Order and are based on the Basin Plan objective.
- i. **Radioactivity.** The Basin Plan includes a water quality objective that “Radionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or

*aquatic life.” The Basin Plan states further that “[A]t a minimum, waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations...” Receiving Water Limitations for radioactivity are included in this Order and are based on the Basin Plan objective.*

- j. **Sediment.** The Basin Plan includes a water quality objective that *“[T]he suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses”* Receiving Water Limitations for suspended sediments are included in this Order and are based on the Basin Plan objective.
- k. **Settleable Material.** The Basin Plan includes a water quality objective that *“Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.”* Receiving Water Limitations for settleable material are included in this Order and are based on the Basin Plan objective.
- l. **Suspended Material.** The Basin Plan includes a water quality objective that *“Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.”* Receiving Water Limitations for suspended material are included in this Order and are based on the Basin Plan objective.
- m. **Taste and Odors.** The Basin Plan includes a water quality objective that *“Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.”* Receiving Water Limitations for taste- or odor-producing substances are included in this Order and are based on the Basin Plan objective.
- n. **Temperature.** The Big Grizzly Creek has the beneficial uses of both COLD and WARM. The Basin Plan includes the objective that *“at no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature.”* This Order includes a receiving water limitation based on this objective.
- o. **Toxicity.** The Basin Plan includes a water quality objective that *“[A]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.”* Receiving Water Limitations for toxicity are included in this Order and are based on the Basin Plan objective.

p. **Turbidity.** The Basin Plan includes a water quality objective that *“Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:*

- *Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.*
- *Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.*
- *Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.*
- *Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.”*

A numeric Receiving Surface Water Limitation for turbidity is included in this Order and is based on the Basin Plan objective for turbidity.

### C. Groundwater

1. The beneficial uses of the underlying ground water are municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply.
2. Basin Plan water quality objectives include narrative objectives for chemical constituents, tastes and odors, and toxicity of groundwater. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use. The tastes and odors objective prohibits taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan also establishes numerical water quality objectives for chemical constituents and radioactivity in groundwaters designated as municipal supply. These include, at a minimum, compliance with MCLs in Title 22 of the CCR. The bacteria objective prohibits coliform organisms at or above 2.2 MPN/100 ml. The Basin Plan requires the application of the most stringent objective necessary to ensure that waters do not contain chemical constituents, toxic substances, radionuclides, taste- or odor-producing substances, or bacteria in concentrations that adversely affect municipal or domestic supply, agricultural supply, industrial supply or some other beneficial use.
3. Groundwater limitations are required to protect the beneficial uses of the underlying groundwater.
4. These waste discharge requirements do not allow groundwater to contain any waste constituent from the project above background levels.

## VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorizes the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP), Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

### A. Influent Monitoring

1. Influent monitoring is required to determine the concentration of rotenone prior to treatment in the off-stream Rotenone Neutralization System. The concentration of rotenone will determine the amount of potassium permanganate required to neutralize the rotenone. If too little or too much potassium permanganate is used in the treatment system, either the residual rotenone or potassium permanganate will cause toxicity in Big Grizzly Creek downstream of Lake Davis in violation of these waste discharge requirements.

### B. Discharge Monitoring.

1. The discharger is exempt from meeting the criteria for priority pollutants as defined in the SIP as described in Section 5.3 of the SIP as described in Findings Section II.K. Therefore, monitoring for these constituents is not required.
2. Monitoring of the discharge of the off-stream Rotenone Neutralization System is required to determine the effectiveness of the BMPs required to neutralize the rotenone and remove the other formulation constituents.
3. **Whole Effluent Toxicity Testing Requirements.**  
Numeric effluent limits have been replaced with Best Management Practices. To assure the BMPs are effective, rainbow trout placed in live cars will be positioned in the receiving waters to assure no toxicity exists in Big Grizzly Creek below Grizzly Valley Dam as described in Section D. Receiving Water Monitoring below. This *in-situ* monitoring will be conducted by qualified and experienced personnel employed by the Discharger. The *in-situ* monitoring is expected to be more effective than laboratory conducted bio-assays due to the fact that 1) any changes in water parameters due to sampling, preservation, and transport to a lab are eliminated, 2) monitoring of the stream is continuous over time, not from a single grab sample, and 3) results are immediate.

### C. Receiving Water Monitoring

## 1. Surface Water

- a. Receiving water monitoring is necessary to assess compliance with receiving water limitations and to assess the impacts of the discharge on the receiving stream.
- b. Neutralization Options 3 and 4 include the use of Big Grizzly Creek as part of the treatment area. Neutralization of the rotenone discharging from the dam should be complete at the 30 minute travel distance from the point where the potassium permanganate neutralizing agent is applied. Beyond that point, Receiving Water Limitations will be applied and appropriate monitoring is required
- c. The receiving water will be monitored for all the chemical constituents known to exist in the rotenone formulations to be used in the project.
- d. Live cars stocked with rainbow trout will be placed in the receiving waters to assure no in-stream toxicity exists in Big Grizzly Creek below Grizzly Valley Dam. The live cages will be monitored throughout the project and fish replaced periodically to reduce stress.

## 2. Groundwater

- a. Section 13267 of the California Water Code states, in part, “(a) *A Regional Water Board, in establishing...waste discharge requirements... may investigate the quality of any waters of the state within its region*” and “(b) (1) *In conducting an investigation..., the Regional Water Board may require that any person who... discharges... waste...that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Water Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports.*” The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the Regional Water Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports. The Monitoring and Reporting Program (Attachment E) is issued pursuant to California Water Code Section 13267. The groundwater monitoring and reporting program required by this Order and the Monitoring and Reporting Program are necessary to assure compliance with these waste discharge requirements. The Discharger is responsible for the discharges of waste at the facility subject to this Order.
- b. Monitoring of the groundwater must be conducted to determine if the discharge has caused an increase in constituent concentrations, when compared to background. Ground water monitoring has been conducted by the PCEHD County Environmental Health Department with the aid of Lawrence Livermore Laboratories on a number of selected wells since the last rotenone application in 1997. Continued monitoring of the ground water will be conducted as described

in the document titled *Determination of the Impact on the Water Quality of Lake Davis and Adjoining Wells*, included as Attachment E-1, to assure the current project does not have an impact on the domestic ground water supply. Ground water monitoring is also required by the California Department of Health Services to assure there are no short or long-term impacts to drinking water supplies.

- c. If monitoring indicates that the rotenone treatment has resulted in an incremental increase in constituent concentrations in groundwater above background, this Order may be reopened and modified and specific numeric limitations established consistent with Resolution 68-16 and the Basin Plan, or a Cleanup and Abatement Order may be issued requiring remedial action to restore ground water quality .

#### **D. Other Monitoring Requirements.**

1. **Municipal Water Supply.** See Section III.E. of this Fact Sheet.
2. **Fish Carcass Disposal.** Subsequent to the treatment of Lake Davis with rotenone, estimated 100 tons of fish carcasses are expected to be collected from Lake Davis and shipped to a disposal site permitted to receive such waste. The amount of fish carcasses removed from Lake Davis and the location of their disposal must be reported to the Regional Water Board.

### **VII. RATIONALE FOR PROVISIONS**

#### **A. Standard Provisions**

Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42.

Section 122.41(a)(1) and (b) through (n) establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Section 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with section 123.25, this Order omits federal conditions that address enforcement authority specified in sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

## B. Special Provisions

1. **Reopener Provisions** See Section C.1. of the Limitations and Discharge Requirements.
2. **Exception From Priority Pollutant Criteria.** An exception from meeting priority pollutant criteria is hereby granted subject to the provisions of section 5.3 of the SIP as described in the Findings Section II.J.
3. **Special Studies and Additional Monitoring Requirements.** Not applicable.
4. **Best Management Practices and Pollution Prevention.** Not applicable.
5. **Construction, Operation, and Maintenance Specifications.** The development of the off-stream Rotenone Neutralization System requires planning, investigation, evaluation, design, or other work requiring interpretation and proper application of engineering and shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code, sections 6735, 7835, and 7835.1. To demonstrate compliance with Title 16, CCR, sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

Neutralization Options 2-4 require various mechanical and chemical processes to adequately neutralize the residual rotenone with potassium permanganate to prevent fish toxicity in Big Grizzly Creek downstream of Lake Davis. As such, it must be designed to operate under various weather conditions, operating personnel must be adequately trained to operate the system, adequate documentation on its operation must be developed and remain on-site, and the names and qualifications of all personnel including emergency contact information must be available to the Regional Water Board and other regulatory agencies prior to operation.

6. **Fish Carcass Disposal.** The rotenone treatment of Lake Davis will result in the generation of an estimated 100 tons of fish carcasses. The dead fish will be collected as practical and transported to an approved disposal facility. The disposal facility must be adequately constructed to prevent waste constituents from the decomposing fish from impacting surface or groundwater quality. The proposed location for the disposal of the fish carcasses must be approved by the Executive Officer prior to disposal.

## VIII. PUBLIC PARTICIPATION

The California Regional Water Quality Control Board, Central Valley Region (Regional Water Board) is considering the issuance of waste discharge requirements (WDRs) that will serve as a National Pollutant Discharge Elimination System (NPDES) permit for the Lake

Davis Pike Eradication Project. As a step in the WDR adoption process, the Regional Water Board staff has developed tentative WDRs. The Regional Water Board encourages public participation in the WDR adoption process.

#### **A. Notification of Interested Parties**

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided through the following: Publication of the Notice of Public Hearing in a local newspaper (the Portola Reporter) on 25 April 2007, newsletter mailing to interested parties by the Discharger on 10 May, posting of the Regional Water Board agenda on the public internet site.

#### **B. Written Comments**

The staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments must be submitted either in person or by mail to the Executive Office at the Regional Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the Regional Water Board, written comments should be received at the Regional Water Board offices by 5:00 p.m. on 25 May 2007.

#### **C. Public Hearing**

The Regional Water Board will hold a two public hearings on the tentative WDRs. In an effort to allow for full public participation and provide opportunity for individuals to provide testimony to the Regional Water Board, a hearing panel comprised of two Regional Water Board members shall be held in the City of Portola, near the site of the proposed project. Due to the lack of a quorum, no actions, including adoption of the permit can be taken at this meeting. The time and place of this first hearing is as follows:

Date: 12 June 2007  
Time: 6:00 PM  
Location: Portola Station Baptist Church  
171 S. Gulling Street  
Portola, CA 96122

A second public hearing will be held by a quorum of the Regional Water Board on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

Date: 21/22 June 2007  
Time: 8:30 am  
Location: Regional Water Quality Control Board, Central Valley Region  
11020 Sun Center Dr., Suite #200  
Rancho Cordova, CA 95670

Interested persons are invited to attend. At the public hearings, the Regional Water Board will hear testimony, if any, pertinent to the discharge, WDRs, and permit. Oral testimony will be heard; however, for accuracy of the record, important testimony should be in writing.

Please be aware that dates and venues may change. Our Web address is <http://www.waterboards.ca.gov/rwqcb5/> where you can access the current agenda for changes in dates and locations.

#### **D. Waste Discharge Requirements Petitions**

Any aggrieved person may petition the State Water Resources Control Board to review the decision of the Regional Water Board regarding the final WDRs. The petition must be submitted within 30 days of the Regional Water Board's action to the following address:

State Water Resources Control Board  
Office of Chief Counsel  
P.O. Box 100, 1001 I Street  
Sacramento, CA 95812-0100

#### **E. Information and Copying**

The Report of Waste Discharge (RWD), related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling (530) 224-4845.

#### **F. Register of Interested Persons**

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Regional Water Board, reference this facility, and provide a name, address, and phone number.

#### **G. Additional Information**

Requests for additional information or questions regarding this order should be directed to Philip Woodward at (530) 224-4853.

## Attachment E-1A

**Pike Eradication Project**

**Determination of the Impact on the Water Quality  
of Lake Davis and Adjoining Wells**

**May, 2007**

**State of California**

**Department of Health Services**

## **Summary of Determination**

Lake Davis is a reservoir located in the Plumas National Forest. It is primarily used for recreation and serves as a domestic water source for the City of Portola and the Grizzly Lake Resort Improvement District - Crocker Welch (GLRID). In the past water from Lake Davis has been treated in the Plumas County Flood Control District (PCFCD) water treatment plant, but this plant was taken out of service in 1997. A new water treatment plant is being built by PCFCD to comply with state regulations. Upon completion of the treatment plant Lake Davis will be brought back into service as a domestic water supply.

The Department of Fish and Game (DFG) has proposed a project to eliminate Northern Pike from Lake Davis in order to prevent the spread of Northern Pike from the reservoir to additional areas in the state. DFG proposes to use Rotenone, a fish poison, in one or more formulations to eradicate the pike.

Health and Safety Code Section 116751 requires that DFG may not introduce a poison to a drinking water supply for purposes of fisheries management unless the State Department of Health Services (DHS) determines that the activity will not have a permanent adverse impact on the quality of the drinking water supply or wells connected to the drinking water supply. In making this determination, DHS shall 1) evaluate the short and long-term health effects of the poison on the drinking water, 2) ensure that an alternative supply of drinking water is provided to the users of the drinking water supply while the activity takes place, and, 3) in cooperation with the Department of Fish and Game, develop and implement a monitoring program to ensure that no detectable residuals of the poison, breakdown products, and other components of the poison formulation remain in the drinking water supply or adjoining wells after the activity is completed.

### **Evaluation of short-term and long-term health effects in drinking water that may result from the proposed project.**

DETERMINATION: It is DHS' conclusion that there will be no short-term or long-term health effects in drinking water from the proposed project because no residuals of rotenone, breakdown products, or other components of the rotenone formulations shall be detectable in Lake Davis water before the lake will be returned to service as a source of drinking water. It has been determined that detection levels for these contaminants are below levels known to be safe. Based on the results from previous applications particularly the 1997 treatment of Lake Davis with the rotenone formulation, Nuson-Noxfish, and DHS' evaluation of the rotenone formulation proposed for this project, CFT Legumine and the alternative formulation, Noxfish®, DHS expects that no detectable residuals of rotenone, breakdown products, and other components of the rotenone formulations will remain in Lake Davis water and sediment. In addition, based on the results of the 1997 treatment and the subsequent monitoring of well water that has taken place, DHS does not expect that the water quality of any of the adjoining wells will be adversely affected and, therefore, no short-term and long-term health effects will result from the proposed project.

### **Alternative supply of drinking water for the City of Portola and the community of GLRID during the treatment and restoration period.**

DETERMINATION: It is DHS' conclusion that the City of Portola's existing water supply, which includes the Commercial Street and the Corporation Yard wells and the Willow Springs, will be adequate to meet the City's water demands during the period of time that Lake Davis is expected to be unavailable for use as a drinking water source.

GLRID's existing well will be adequate to meet water demands during the period of time that Lake Davis is expected to be unavailable as a drinking water source.

Should Lake Davis, as a result of conditions associated with the proposed treatment project, be unavailable for use as a drinking water source and the City of Portola and/or GLRID are unable to meet water demands, DFG shall provide alternative water supplies to ensure that those water demands are met. DFG shall have in place an approved contingency plan to provide, as necessary, alternative water supplies prior to the implementation of the project. DFG has been working with the City of Portola and GLRID and has developed contingency plans to provide alternative water supplies that will be in place prior to the implementation of the treatment project.

**Monitoring Program to ensure that no detectable residuals of Rotenone formulation components or breakdown products remain in Lake Davis water or adjoining wells.**

DETERMINATION: DHS, in cooperation with DFG, will undertake a monitoring program designed to determine that the water in Lake Davis is suitable for use as a source of drinking water when all constituents in the CFT Legumine formulation, including rotenone, breakdown products, and other components of the formulation are below the level of detection based on detection levels set by DHS. In addition, the dissolved oxygen and biological oxygen demand must be returned to normal levels. A monitoring program has been developed by DFG and approved by DHS which includes sampling of Lake Davis water and sediment before and after treatment. Sampling will continue until it has been determined that residuals of all constituents of the formulation including rotenone, breakdown products and other components are below the level of detection in three consecutive water and sediment samples. Monitoring of the tributaries that are treated will also be conducted including water and sediment sampling to ensure that no detectable residuals of formulation chemicals remain. In addition, physical parameters such as dissolved oxygen and biological oxygen demand must have returned to normal levels before the lake water can be used in the water treatment plant. Analyses of Lake Davis water and sediment samples will be carried out by DHS and DFG laboratories.

The Plumas County Environmental Health Department, in cooperation with the Lawrence Livermore National Laboratory, will complete oxygen isotope analysis of the wells in the current groundwater monitoring network and of additional adjoining wells that have been identified to determine which wells may be directly influenced by surface water from Lake Davis and Big Grizzly Creek. That work is expected to be completed in August. The information from that work along with other factors will be used to establish those wells that will be subject to long-term monitoring for formulation chemicals used in the treatment project.

**The impact of dead fish in the lake and mitigation steps.**

DETERMINATION: DFG shall have a cleanup plan to ensure that dead fish are removed from the lake before the water is used as a source of drinking water by GLRID and the City of Portola.

## **Brief History**

In August 1994, Northern Pike were reportedly found in Lake Davis. According to the Department of Fish and Game (DFG), eradication of the pike was necessary to prevent their further spread in the state and to protect the trout fishery at Lake Davis. It was feared that escape of pike into Big Grizzly Creek below the reservoir could be accomplished either by spilling of surface water from the reservoir during a major storm event or by withdrawal from the bottom of the reservoir through the dam outlet. From Big Grizzly Creek, pike could be carried to the Middle Fork Feather River and eventually to Lake Oroville. The Department of Fish and Game reported that pike are likely to pose a threat to the anadromous and resident fisheries.

In July 1994, an updated Programmatic Environmental Impact Report (PEIR) was developed which described the use of rotenone formulations, as needed, throughout the State of California. This report described the chemical formulations and the general practices used in their application. A Notice of Preparation for the current project was prepared in response to requirements by the California Environmental Quality Act (CEQA) on February 9, 1995. A draft Environmental Impact Report (EIR) was developed in March 1996. The Final EIR was developed in January 1997.

DFG has historically used rotenone formulations to manage fisheries in California. Prior to Lake Davis, Frenchman Lake was treated to eliminate Northern Pike in 1991. Although rotenone formulations have been used near drinking water supplies, with the exception of Lake Davis, no such formulations had been applied directly into a drinking water supply.

Prior to the implementation of the 1997 project, the Legislature adopted Health and Safety Code Section 116751, which requires that DFG may not introduce a poison to a drinking water supply for purposes of fisheries management unless the State Department of Health Services (DHS) determines that the activity will not have a permanent adverse impact on the quality of the drinking water supply or wells connected to the drinking water supply. In making this determination, DHS shall 1) evaluate the short and long-term health effects of the poison on the drinking water, 2) ensure that an alternative supply of drinking water is provided to the users of the drinking water supply while the activity takes place, and, 3) in cooperation with the Department of Fish and Game, develop and implement a monitoring program to ensure that no detectable residuals of the poison, breakdown products, and other components of the poison formulation remain in the drinking water supply or adjoining wells after the activity is completed.

Although the 1997 project was initially thought to be successful Northern Pike were subsequently detected in Lake Davis in 1999. Because of similar concerns over the escape of Northern Pike into the Feather River and eventually Lake Oroville, DFG has proposed to undertake a second eradication project. A draft EIR was developed and noticed for comment on September 1, 2006. The final EIR was finalized in January, 2007.

## **Impact of Treatment on the Environment**

The law requires that DHS evaluate several issues regarding the impact of rotenone treatment on the environment. Those issues include the short-term and long-

term health effects that may result from the treatment of the lake, taste and odor concerns and the disposal of dead fish. The potential for the contaminants to reach the groundwater around Lake Davis was also reviewed. The law also requires that DHS and DFG develop a monitoring plan to ensure that no detectable levels of formulation constituents including rotenone, breakdown products, and other components of the formulation are present before Lake Davis can be returned to service as a drinking water source and in adjoining wells affected by the lake.

### **Chemicals of Concern: Proposed Rotenone Formulations**

#### **CFT Legumine®**

The formulation labeled CFT Legumine® is the trade product proposed for this treatment. The formulation contains rotenone, rotenolone, and non-rotenoid organic constituents including methyl pyrrolidone and diethylene glycol monoethyl ether and volatile organic chemical (VOCs) such as 1,3,5-trimethylbenzene and 1-butylbenzene and semi-volatile organic chemicals (SOCs) such as naphthalene and methylnaphthalene.

#### **Noxfish®**

The formulation labeled Noxfish® is the other trade product that was considered for this treatment. DFG has indicated that Noxfish® will only be used if there is an insufficient amount of CFT Legumine® to complete the treatment. The formulation contains rotenone, rotenolone, and non-rotenoid organic constituents including VOCs such as xylene isomers, toluene and trichloroethylene and SOC such as naphthalene.

Potassium permanganate will be used to neutralize rotenone residuals if such residuals are discharged into Big Grizzly Creek after treatment.

The concentrations of formulation chemicals and potassium permanganate expected to be present in Lake Davis water at the time of treatment as estimated by DFG can be found in Table 1.

Table 1

Chemical Name	Estimated Concentration in Treatment <sup>1</sup> ug/l	Detection Level ug/l	Max. Cont. Level (MCL) or Notification Level (NL) ug/l
<b>CFT Legumine® Formulation</b>			
Rotenone (active ingredient)	42.1	2	40 (NL)
Rotenolone	5.2	2	
1-Methyl-2-pyrrolidinone (Methyl pyrrolidone)	87.8	11 <sup>^</sup>	300 (NL) **
Diethylene glycol monoethyl ether (Diethylene glycol ethyl ether)	581.1	12 <sup>^</sup>	400 (NL) **
1,3,5-Trimethylbenzene (mesitylene)	0.004		
sec-Butylbenzene	0.004		
1-Butylbenzene (n-Butylbenzene)	0.078		
4-Isopropyltoluene (isopropyltoluene)	0.005		
Methylnaphthalene	0.136	0.5	
Naphthalene	0.341	0.5	17 (NL)
<b>NoxFish® Formulation</b>			
Rotenone	48.81	2	4 (NL)
Rotenolone	14.641	2	
Trichloroethene ( Trichloroethylene)	0.071	0.5	5 (MCL)
Toluene	1.757	0.5	150 (MCL)
1,3- and/or 1,4-Xylene (M/p xylene)	0.595	0.5	1750 (MCL)
1,2-Xylene(o xylene)	0.074	0.5	1750 (MCL)
Isopropylbenzene	0.050		
1-Propylbenzene(n-Propylbenzene)	0.303		
1,3,5-Trimethylbenzene (mesitylene)	0.839		
1,2,4-Trimethylbenzene	9.761		
1-Butylbenzene (n-Butylbenzene)	8.785		
4-Isopropyltoluene (p-Isopropyltoluene)	0.976		
Naphthalene	68.326 (w/ EPA 8260)	0.5	17 (NL)
Potassium permanganate	4 mg/L-water		

<sup>1</sup> Based on chemical analysis of commercial formulations and proposed treatment concentration of 1 mg-formulation/L receiving water, concentrations will vary by lot by approximately 10 percent. Data listed from DFG Pesticide Laboratory Reports (CFT Legumine: report date 7/7/04, lab no P-2399; Noxfish: report date 7/9/02, Lab Nos P-2297, 2298, 2300, 2302).

\* EPA method 8260

<sup>^</sup> EPA method 8270

\*\* Notification Level developed for the implementation of the Lake Davis Treatment Project

<sup>^^</sup> Tentative Detection Levels

## **Impact of Treatment During Past Events**

### **Persistence of Residuals**

In order to determine if the project will not have a permanent adverse impact on the quality of the Lake Davis or adjoining wells potentially connected hydraulically to Lake Davis, the Department reviewed rotenone applications in the Kaweah River and Tulare Lake Basin, as well as the 1991 Lake Frenchman application and the 1997 Lake Davis application.

With the exception of Lake Davis, none of the other rotenone applications involved drinking water sources.

### **Kaweah River and Tulare Lake Basin Applications**

Following treatment in 1987 for white bass, the DFG evaluated the persistence of rotenone and its associated compounds, including the VOC's found in the Nusyn/Noxfish® formulation. The Nusyn/Noxfish® formulation is similar to the Noxfish® formulation with the exception that the Noxfish® formulation does not contain piperonyl butoxide. The study attempted to address concerns relating to long term affects of the treatment on both the surface water and the ground water in the vicinity of the treated areas. Immediately after application, rotenone concentrations in the surface water averaged 148 parts per billion (ppb) and ranged from <2 ppb to 370 ppb. The half-life values in surface water averaged 1.8 days. Rotenone degraded from an average of 87 ppb to non-detectable levels within 15 days after application.

Groundwater was evaluated multiple times after these applications. During the testing period of 49 days after the application, no detectable rotenone or rotenolone were found.

Concentrations of inert ingredients in surface water, xylene, benzene, ethyl benzene, trichloroethylene, and naphthalene had dissipated, diluted and degraded to non-detectable levels within 21 days. These compounds were also not found in groundwater at detectable concentrations for 49 days after treatment (1).

In at least one instance, degradation did not occur within the expected 21 day time frame. At Meiss Lake in 1988 and 1990, rotenone and rotenolone concentrations remained above the detection levels for five weeks. At Wolf Creek Lake in 1991, concentrations were detected after six weeks. This was reportedly due to lower water temperatures during this time. Water temperatures below 11 °C (52°F) were recorded during this time. These temperature effects are consistent with findings that rotenone had a half-life of 10.3 days in temperatures from 0-5°C, while its half-life was approximately 0.94 days when the water temperature was above 20°C (2).

### **Frenchman Lake Application (1991)**

Frenchman reservoir was treated at a concentration of 2 parts per million (ppm) Nusyn/Noxfish® during the period of June 11-13, 1991. The treatment was initiated to eliminate Northern Pike from the reservoir. A potassium permanganate detoxification station was installed below the dam's outlet into Little Last Chance Creek. The lake itself was not detoxified with potassium permanganate. Instead, rotenone was eliminated through natural degradation. Water temperatures varied from 10° to 22°C. Residues of both rotenone and rotenolone reached non-detectable levels in the reservoir approximately 21 days after treatment. Rotenone and rotenolone levels reached non-detectable residues in sediment samples 14 days after treatment. Neither rotenone nor rotenolone were detected at any time in samples taken from three campground wells located adjacent to the reservoir.

Other organic compounds present in the Nusyn/Noxfish® formulation were detected in Frenchman Lake and Little Last Chance Creek after the June 11 treatment. With the exception of trichloroethylene, all of these compounds were below detectable levels by June 26, thirteen days after treatment. Trichloroethylene was present on July 2, the final day of

scheduled sampling. Unfortunately, resampling was not completed until November 8, 1991. Trichloroethylene was not detected at that time.

In addition to the organic compounds discussed above, several other compounds that are not known constituents of the formulated rotenone product were detected in the reservoir. By July 2, levels of these organic compounds were below detectable levels (0.2 ppb).

Sediment samples indicated the short term presence of naphthalene and methyl naphthalene. The November 8, 1991 final sampling event revealed no residues of these compounds.

### **Lake Davis Application (1997)**

Lake Davis was treated with the Nusyn/Noxfish® liquid formulation and the Pro-Noxfish® powdered formulation on October 15 and 16, 1997. Potassium permanganate was used to detoxify water released from the reservoir into Big Grizzly Creek.

The mean lake water rotenone level was 42 ppb immediately following treatment on October 17, 1997, and rotenone concentrations remained at or above 10 ppb throughout the lake for two weeks. Rotenone and rotenolone residues were reduced to below detection levels (2 ppb) within 48 days after treatment. The half-life of rotenone was 7.7 days in the lake with a water temperature range of 10 to 12 degrees centigrade. Maximum concentrations of VOCs trichloroethylene (0.8 ppb), toluene (3.5 ppb), ethyl benzene (0.5 ppb), total xylene (2.6 ppb) and trimethylbenzene (2.4 ppb) and SOC naphthalene (210 ppb), 1-methylnaphthalene (210 ppb), and 2-methylnaphthalene (390 pp) were detected immediately after treatment. The VOCs persisted for less than one week and the SOC naphthalene persisted for less than two weeks. Piperonyl butoxide (PBO) persisted in lake water for several months after treatment. However, PBO is not part of either the CFT Legumine® or the NoxFish® formulations.

Rotenone and rotenolone levels were detected in lake sediment after treatment. However, both chemicals were below detection levels in sediment within 50 days after treatment. No VOCs were detected in lake sediment while SOC naphthalene, 1-methylnaphthalene and 2-methylnaphthalene were detected in lake sediment after treatment. All three chemicals were below detectable levels within 50 days after treatment.

### **Proposed 2007 Treatment Project**

Under the proposed project DFG plans to use the CFT Legumine® rotenone formulation. However, if necessary, the NoxFish® formulation may also be used.

The CFT Legumine® formulation contains a mixture of VOCs and SOC naphthalene and more water soluble chemicals, methyl pyrrolidone and diethylene glycol monoethyl ether. As with NoxFish® the VOCs and SOC naphthalene in the CFT Legumine® formulation are expected to reach non-detectable levels with a week to several weeks. However, methyl pyrrolidone and diethylene glycol monoethyl ether, would be expected to dissipate more slowly. These two chemicals, as indicated in Table 1, will be at much higher initial concentrations in the lake water and, because they are water soluble, will not readily dissipate through volatilization. However, both chemicals are biodegradable, which is the principle mechanism by which they are expected to dissipate. (3) (4)

The NoxFish® formulation is essentially the same as the Nusyn/Noxfish®

formulation used during the 1997 treatment with the exception that the NoxFish® formulation does not contain piperonyl butoxide and the isomers of methylnaphthalene (1-methylnaphthalene and 2-methylnaphthalene). Based on the results of previous treatment projects the VOCs and SOCs in the formulation would be expected to reach non-detectable levels within a week to several weeks after application with the SOCs principally naphthalene remaining at detectable levels longer than the VOCs. The rate of reduction of the VOCs and SOCs in the lake will be most affected by the initial concentration of the chemicals in the lake water after application and the water temperature as these chemicals are volatile and will be released from the lake water into the air more rapidly under warm water temperature conditions. If the lake is treated as planned during late September/early October when the water temperature is still relatively warm, the rate of reduction is expected to be rapid.

Based on the results of previous treatment projects, rotenone and rotenolone are expected to dissipate to below detectable levels within several weeks regardless of which formulation is used. The rate at which both these chemicals dissipate will mainly be dependent on the water temperature. If the application takes place in late September/early October as planned, the rate of dissipation is likely to be faster.

Based on the results the Frenchman Lake application and the 1997 Lake Davis application, certain chemicals such as rotenone, rotenolone, naphthalene and methylnaphthalene are likely to be initially detected in the lake sediment. However, it is expected that these chemicals will dissipate to below detectable levels several weeks after the initial treatment.

Based on the results from the previous treatment projects, particularly the 1997 Lake Davis application where ongoing monitoring of 78 wells has not detected any of the chemicals used in the application, the chemicals contained in either of the two rotenone formulations are not expected to affect adjoining wells that may be hydraulically connected to Lake Davis.

### **Proposed Monitoring Program**

In order to determine that no detectable residuals of rotenone, breakdown products, and other components of the formulations remain in Lake Davis water or sediments or adjoining wells after the project is completed, DHS, in cooperation with DFG, has developed a monitoring program that will: 1) establish the baseline of Lake Davis water quality prior to implementation of the project and 2) track the levels of residues of rotenone, breakdown products, and other components of the formulations until all residues in water and sediment samples are below detectable levels. In addition, water and sediment from treated tributaries that flow into Lake Davis will be monitored to ensure that residues of all formulation chemicals are below detectable levels.

In order to determine the natural state of Lake Davis baseline water and sediment sampling will be undertaken. The baseline sampling will establish levels of physical and chemical constituents such as dissolved oxygen, pH, and biochemical oxygen demand as well as the components of the formulations including VOCs and SOCs. Following the application of the formulations to Lake Davis and its tributaries, monitoring of Lake Davis water and sediments and water in selected wells that have the potential to be hydraulically connected to Lake Davis will be undertaken.

## **Lake Davis Water and Sediment Sampling**

The monitoring program that has been developed for sampling Lake Davis water and sediment will be similar to the program undertaken during the 1997 Lake Davis application. Water samples will be collected at 10 locations throughout the lake. At least two samples will be collected at five shallow locations, one at the lake surface and one at depth, and three samples will be collected at five deep locations, one at the lake surface, one at mid-depth and one at lower depth to obtain a cross-sectional picture of the levels of any residues of formulation chemicals remaining in the lake water. Water and sediment samples will be collected from all tributaries that have been treated. Sediment samples will also be collected at five locations in the lake to determine if any residues remain in the lake sediments.

All lake water samples will be analyzed by the DHS laboratory and sediment samples will be analyzed by the DFG laboratory. Lake water and sediment will not be considered free of all residues of formulation chemicals until three consecutive lake water and sediment samples are found to be at non-detectable levels for all formulation chemicals. In addition, a state certified third party laboratory will also analyze the last set of lake water and sediment samples to corroborate that the lake water and sediment are at non-detectable levels for all formulation chemicals. Upon that determination, Lake Davis will be considered acceptable for use as a domestic water supply.

## **Groundwater Sampling**

During the 1997 Lake Davis application five wells that adjoined Lake Davis were monitored. In addition, in 1999 the Plumas County Environmental Health Department (PCEHD) undertook a program of monitoring groundwater in over 80 wells. That program continues into the present and now includes 78 wells, of which 76 wells are monitored annually and two wells are monitored semi-annually. To date there has been no indication from the monitoring results that the 1997 application has affected the groundwater drawn by these wells.

Because of the uncertainty as to the relationship between water in Lake Davis and the groundwater drawn by these wells, PCEHD is working with the Lawrence Livermore National Laboratory to conduct oxygen isotope analysis of the wells in the current groundwater monitoring network and of additional adjoining wells that have been identified to determine those wells that draw groundwater that may be directly influenced by surface water from Lake Davis and Big Grizzly Creek. PCEHD expects to complete that work in August. The information developed from that work along with other factors will be used to select wells for monitoring after the lake is treated. The post treatment well water monitoring program will include sampling and analysis of well water for all formulation chemicals until three consecutive well water samples are found to be at non-detectable levels for all formulation chemicals. Thereafter, these wells will be monitored on an annual frequency.

## **Alternative Water Supply During Treatment**

As part of DHS' responsibility under Health and Safety Code Section 116751, DHS must ensure that an alternative supply of drinking water is provided to the users of the affected drinking water supply while the project takes place. The Department of Fish and Game is responsible for providing alternative water supplies to both the City

of Portola and GLRID should they be needed. The following is an assessment of the existing water supplies of the City of Portola and GLRID and the need for alternative water supplies.

### **City of Portola**

The City of Portola uses two sources of water to meet the City's water demands: wells and a spring. The City has two wells: the Commercial Street well and the Corporation Yard well. The spring source is Willow Springs.

Water demand and water production data for the last full year of record, 2005, indicates that the maximum day demand (MDD) for the City during 2005 was 930 gallons per minute (GPM). This was the highest MDD for the previous five years. The most recent DHS water production records provided by the City indicate that the two wells and Willow Springs have approximately 1,165 GPM of production capacity, which was sufficient to meet that demand with additional capacity in reserve (5). Data for 2006 up through the month of October indicate that the highest 2006 monthly demand was 35.8 million gallons (MG), which occurred in July. Monthly demand subsequently decreased to 34.8 MG in August, 31.8 MG in September, and 15.6 MG in October (6) (7). Although, as a result of potential new development, the City's water demand may increase by the time Lake Davis is treated, the treatment is scheduled to take place in late September or early October, which, as the City's recent water demand data indicate, will be at a time when water demand will have decreased significantly. Therefore, even with some nominal increase in water demand due to growth, an alternative water supply does not appear to be needed to supplement the City's existing water supply during the expected duration of the proposed treatment project.

However, as a precaution, DFG shall develop a contingency plan to provide an alternative water supply if the City can not meet water demands and the lake is not available as a drinking water source as a result of conditions associated with the proposed treatment project. The plan shall be submitted to DHS for review and approval prior to the implementation of the proposed treatment project. In cooperation with the City, DFG has developed a contingency plan to provide the City with alternative water supplies prior to the implementation of the proposed treatment project.

### **GLRID - Crocker Welch**

GLRID has one well that serves as the sole source of water supply. The well is located at the site of the existing Lake Davis water treatment plant. GLRID also has a 200,000 gallon storage tank that can meet about three days of water demand during the summer months, which has helped GLRID get through power outages that are common, especially during the summer. The well produces about 40-45 GPM during the early spring, but tends to slowly taper off throughout the summer, usually down to around 30 GPM by the end of September. GLRID implemented voluntary conservation measures in the summer of 2005, which mainly involved an irrigation schedule for their customers (5). These measures have been adequate to keep the system from running out of water. Assuming that these conditions do not change prior to the implementation of the proposed treatment project and given the expectation that water demand will have begun to decrease at the time that the project is scheduled to begin, GLRID should have sufficient water source capacity to meet water demands for the duration of the treatment project.

However, as a precaution, DFG shall develop a contingency plan to provide an alternative water supply should GLRID be unable to meet water demands and the lake is not available as a drinking water source as a result of conditions associated with the proposed treatment project. The plan shall be submitted to DHS for review and approval prior to the implementation of the proposed treatment project. In cooperation with GLRID, DFG has developed a contingency plan to provide GLRID with an alternative water supply prior to the implementation of the proposed treatment project.

## **Conclusions & Requirements**

In conclusion, DHS has determined that the proposed Lake Davis treatment project will not have a permanent adverse impact on the drinking water quality of Lake Davis or the surrounding wells if the following conditions are met:

- 1) Concentrations of chemicals present in the CFT Legumine® and NoxFish® formulations and of chemicals known or suspected to be breakdown products of chemicals in the formulations dissipate to non-detectable levels in samples of lake water and sediment before the lake is returned to service as a source of drinking water.
- 2) Levels of Biological Oxygen Demand and Dissolved Oxygen are returned to their pre-treatment levels before the lake is returned to service as a source of drinking water.
- 3) All submitted and approved plans shall be followed. These plans include treatment plans, monitoring plans, health and safety plans, and contingency plans for alternative water supplies.
- 4) DFG has developed contingency plans to provide alternative water supplies to the City of Portola and GLRID. The contingency plans shall be submitted to DHS for review and approval prior to the implementation of the proposed treatment project. DFG shall implement the contingency plans should Lake Davis, as a result of conditions associated with the proposed treatment project, be unavailable for use as a domestic water source and the City of Portola and/or GLRID are unable to meet water demands

## **References**

1. DFG. "Rotenone Residues in Water Following application to Kaweah River and Tulare Lake Basin, California." Administrative Report 88-1. 1988
2. DFG. "B.J. Finlayson and J.M. Harrington. "Chemical Residues in Surface and Ground Waters Following Rotenone Application to California Lakes and Streams. 1991
3. "Concise International Chemical Assessment Document 35, *N*-METHYL-2-PYRROLIDONE," World Health Organization, Geneva, 2001.  
<http://www.inchem.org/documents/cicads/cicads/cicad35.htm>, Accessed November, 13, 2006.
4. "SPECTRUM, Chemical Fact Sheet",  
<http://www.speclab.com/compound/c111900.htm>, Accessed November 13, 2006.
5. Direct communication, Mike McNamara, DHS, October 24, 2006.
6. Direct communication, Mike McNamara, DHS, November 15, 2006
7. Direct communication, Mike McNamara, DHS, November 16, 2006